

Basic Program Information

Administrative Unit Name: Physical Sciences, Mathematics & Engineering (PSME)

Administrative Unit Mission: To provide undergraduate education founded on a rigorous, applied treatment of STEM fundamentals coupled with modern equipment and techniques; as well as to prepare students for transfer to a four-year university or up skill workforce programs.

Administrative Members and Departments covered in this program review (Please list all members of your Administrative Unit along with position title):

Name	Department	Position
Peter Murray	PSME	Dean
Ruyu Chen	PSME	Admin Assistant
Luis Barreto	PSME	Sr System Admin
Mario Ramos	PSME	System Admin
Jenny Liang	Physics/Engineering	Lab Technician
Anna Wu	Chemistry	Lab Technician

Section 1. Data and Trend Analysis

1.1. Program/Department Data

Dimension	2009-2010	2010-2011	2011-2012
Students Served		9,018	9,323
Faculty Served			
Staff Served		5	5
Full-time FTEF		27.9	31.6
Part-time FTEF		42.6	42.7
Full-time Staff		5	5
Part-time Staff		0	.5

1.2 Using the data provided above, include a short narrative analysis of the following indicators.

Please attach supporting studies or data to the final program review submitted to your Vice President/President.

1. Population served (Please use prompts below to describe the faculty, staff and/or students you primarily serve):
 - a. Locations/times of service (Day, Evening, Off Campus, etc.)

Main Campus, Middlefield Campus, and online.

- b. How was this tracked?

Enrollment data

- c. What is the trend?

Growth at 5% per year

2. Scheduling of services and/or offerings (Please use the following prompts to describe the scheduling of your Administrative Unit):

- a. How have you adjusted your scheduling to align with the Core Missions of Basic Skills, Transfer and Workforce?

The courses are offered at times when each population is available. The transfer sequences are scheduled to permit students to register for their classes while they are in track.

- b. For Instructional AU, please comment on the effectiveness of your divisional curriculum processes, including any suggested areas of improvement or needed support.

The PSME curriculum is very effective. The Faculty cooperate with each other. The quality of the CORs are 95% complete. The incorporation of the Computer Science and all of the changes in Engineering and math has stressed the PSME Curriculum faculty time commitment. The FT and PT Faculty have developed a number of new CORs as well as actual courses. There are two cross divisional CORs with Biology and one new AS degree in Sustainability which addresses multidisciplinary courses.

3. Staffing structure (Does the staffing structure of your Administrative Unit meet the program or department's needs? If yes, please explain. If not, consider the following prompts in framing your answer.)

i. Which aspects of the work are key to the institution's mission?

The Administrative Assistant, Lab Techs and Computer Techs. All are key for different reasons.

ii. Has the staff increased, decreased or remained the same to meet those changes?

Remained the same. A PT Administrative Assistant has been brought in to fill the scheduling and all of the paperwork required.

How has technology affected the workload in your office?

Within the office, the Banner system has caused additional work but has not paid off. In the classrooms, PSME has been an island to introduce new technology into the classroom. This has required considerable time in the Dean, Faculty and Sys Admin staff.

iii. Does the workload have significant peaks and valleys during the year? If so, describe.

The fall quarter is a killer with new curriculum, budgets and all of the new paperwork created around SLO, Program review, scheduling, advertising, fund raising, and grants. Winter continues the pattern but backs off in March. Spring is the time to look forward to the next academic year. It is a vicious cycle and becoming more bureaucratic.

iv. Do you anticipate the workload will increase, decrease or remain constant in the upcoming one to three years? Is this a temporary situation?

It will increase which is putting a strain at all levels.

v. What steps can be taken to improve your program or department's organizational efficiency within its current budget?

Some efforts will have to be ignored. The paperwork and documentation is required to have resources provided. Other efforts that have more student impact will have to be deferred.

vi. What strategies have been used to improve the delivery of support services within the program or department?

This has been very difficult. Having good staff holds the fragile framework in tact. Some things are slipping through the cracks but have to be tolerated.

4. Budget analysis:

a. In light of budget constraints and fewer college resources, please describe the process used to make adjustments and reallocations of budgets between departments in your administrative unit. If you have not reallocated budgets within your unit, please describe how that would work in your AU in future resource allocation cycles.

The last several years have been a juggling act. There have been a number of unexpected costs for PSEC and classroom technology. The goal is to get additional grants and Foundation funding to offset the lack of traditional funds.

5. Administrative Professional Development: Please describe any areas of training or resources needed (for example: Tenure, Evaluation, Enrollment Management).

Faculty and others should be trained to Dean so there are smoother transitions. The current practice creates inconsistency and often large gaps in Division Administration.

6. Basic Skills Programs (if applicable). For more information about the Core Mission of Basic Skills, see the Basic Skills Workgroup website: <http://foothill.edu/president/basicskills.php>
 - a. Please discuss current outcomes or initiatives related to this core mission.

The Math Dept has created a summer bridge program, MathMyWay, compressed Algebra (Math 108) and Statway.

7. Transfer Programs (if applicable). For more information about the Core Mission of Transfer, see the Transfer Workgroup website: <http://foothill.edu/president/transfer.php>
 - a. Please discuss current outcomes or initiatives related to this core mission.

PSME has an excellent transfer record for STEM subjects.

8. Workforce/Career Technical Education Programs (if applicable). For more information about the Core Mission of Workforce, see the Workforce Workgroup website: <http://foothill.edu/president/workforce.php>
 - a. Please discuss current outcomes or initiatives related to this core mission.

This is a new area for PSME. The primary area have been in Computer Science and Engineering.

9. Student Equity: Foothill-De Anza Community College District Board policy and California state guidelines require that each California community college submit a report on the college's progress in achieving equity in five specific areas: access, course completion, ESLL and basic skills completion, degree and certificate completion, and transfer. For the latest draft of the Student Equity Report, please see the ESMP website:

<http://foothill.edu/staff/irs/ESMP/index.php>

- a. To better inform the Student Equity efforts at Foothill College, please comment on any current outcomes or initiatives related to increasing outreach, retention and student success of underrepresented students in your program.

PSME has developed multiple pathways to include students of all backgrounds. The new STATway program goal is the increased retention of our students. The proposed STEM summer camps for 11th and 12th graders will encourage UR students to consider STEM careers.

Section 2. Learning Outcomes Assessment Summary

2.1. Insert – 2011-2012 Four Column Report for AU-SLO Assessment from TracDat, please contact the Office of Instruction to assist you with this step if needed.

Unit Assessment Report - Four Column

Foothill College

AU - Instruction & Institutional Research

Mission Statement: The mission of the Office of Instruction and Research is to shape the future direction and environment of student learning at Foothill through the implementation of creative solutions and innovative ideas in conjunction with evidence-based decision making and research.

Administrative Unit SLOs (AU-SLOs)	Means of Assessment & Target / Tasks	Assessment Findings	Action & Follow-Up
AU - Instruction & Institutional Research - 1 - Student Information - Students have access to current college catalog, course outlines and Student Learning Outcomes. Year(s) to be Assessed: 2010-2011 2011-2012 AU-SLO Status: Active	Assessment Method: An annual spring survey will be distributed to all Faculty, Staff and Administrators containing a question for each AUO with 5 possible responses: Strongly disagree, Disagree, Agree, Strongly agree and Not Applicable/Other. Assessment Method Type: Survey Target: The target is to achieve an 80% agreement (Agree or Strongly Agree) rate among all respondents.	09/07/2011 - Agree = 46.7% Strongly Agree = 38.9% Total = 85.6% Result: Target Met Year This Assessment Occurred: 2010-2011 Resource Request: The Office of Instruction is not sufficiently staffed to serve the overall flow of curriculum and state accounting. There is a need for a FT classified staff member to assist with curriculum and scheduling.. Related Documents: Spring 2011 AUO Survey Results	10/14/2011 - Although the target was met, there are many areas for improvement. The Office of Instruction will continue to provide training on Tracdat, and improve the accessibility of SLOs to the internal and external audience via the website.
AU - Instruction & Institutional Research - 2 - Core Mission Instruction - Students are offered career, workforce and basic skills instruction with approved college curriculum in accordance to Title 5 and the Educational Code. Year(s) to be Assessed: 2010-2011 2011-2012 AU-SLO Status: Active	Assessment Method: An annual spring survey will be distributed to all Faculty, Staff and Administrators containing a question for each AUO with 5 possible responses: Strongly disagree, Disagree, Agree, Strongly agree and Not Applicable/Other. Assessment Method Type: Survey Target: The target is to achieve an 80% agreement (Agree or Strongly Agree) rate among all respondents.	09/07/2011 - Agree = 52.3% Strongly Agree = 33% Total = 85.3% Result: Target Met Year This Assessment Occurred: 2010-2011 Related Documents: Spring 2011 AUO Survey Results	

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2.3 Administrative Unit Student Learning Outcomes: Please provide observations and reflections below after reflecting on your AU-SLOs in TracDat and reviewing your divisional Program-Level SLOs.

Will occur in 2013-14.

2.3.a What findings or themes can be gathered from the AU-SLOs or departmental Program-Level SLO assessments?

2.3.b Does any of the data suggest that revisions might be necessary in order to support faculty, staff and/or students to successfully achieve the AU-SLOs?

2.3.c How has assessment of AU-SLOs led to improvement in student success at the institution?

Section 3: Program Goals and Rationale

Program goals should be broad and incorporate some sort of measurable action that connects to Foothill’s core missions, [Educational & Strategic Master Plan \(ESMP\)](#), the division plan, and SLOs.

3.1 Previous program goals from last academic year

Goal	Original Timeline	Actions Taken	Status/Modifications
This is a new plan			

3.2 New Goals: Goals can be multi-year

Goal	Timeline (long/short-term)	How will this goal improve student success or respond to other key college initiatives	Action Steps
1. Create flexible class(room) and lab environments that takes advantage of low cost current technology.	Multiyear and continuously ongoing. The PSEC technology is incomplete and the 5600 remodel needs to be accommodated. This should be a model for other class(rooms) and labs. This could support Onizuka educational infrastructure.	This affects Basic Skills, Transfer and Workforce. Basic Skills needs to have workspaces and the tools to get in and outside classroom support. The Transfer and Workforce need access to simulations, computational tools, visualization systems, and access to lecture and class materials.	1. Identify the various needs of Faculty and Students based on low cost access by Faculty and students. 2. Provide (low cost to student) device independent access to online resources. 3. Solicit support from external vendors to provide technology. 4. Coordinate with ETS to provide the infrastructure to accomplish the goals.
2. Provide Faculty the resources to permit them to reinvent how they teach.	This is a multiyear effort and continuously ongoing.	This affects Basic Skills, Transfer and Workforce. Students need to have more immediate access to resources as well as course materials. The Faculty need to be offer quality education in class, hybrid as well as online.	1. Provide access to external resources and professional development. 2. Assist in the identification of what students need to know, how to learn and develop conceptual thinking. 3. Look at free materials, MOOCs, new curriculum,

			<p>flipped classes, use of online TAs, etc. 4. Participate in grants and conferences.</p>
<p>3. Support the Science Learning Institute (SLI) and direct resources to meet the Institute’s objectives.</p>	<p>This is through 2020. The goals and funds will change each year as the Institute evolves.</p>	<p>This affects Transfer and Workforce. SLI will provide internships, scholarships, new programs such as sustainability, new curriculum, Outreach, Professional Development and other resources as required.</p>	<p>1. Identify, track and initiate funding opportunities. 2. Meet once a year with the SLI Advisory Board. 3. Manage all aspects of the SLI initiatives. 4. Evaluate, update and initiate SLI initiatives. 5. Develop presentations that reflect the vision and progress of the SLI.</p>
<p>4. Support Faculty in increasing student success and retention.</p>	<p>This is a multiyear effort and continuously ongoing.</p>	<p>Build on STEMway (NSF) to identify and develop the support environment for all PSME students. This affects Basic Skills, Transfer and Workforce.</p>	<p>1. Further expand the services of the PSME Center to address the class, financial and counseling needs of STEM students. 2. Develop a student mentoring program.</p>
<p>5. Continue to develop STEM Pathways for both high school and 4 year colleges.</p>	<p>This is a multiyear effort and continuously ongoing.</p>	<p>This affects Basic Skills, Transfer and Workforce.</p>	<p>1. Develop STEM summer camp 2. Offer STEM course at local HS. 3. Develop partnerships and co-propose on grants with 4 yr colleges. 4. FH internships at 4 year colleges.</p>

Section 4: Program Resources and Support

4.1 After reviewing the requests from the programs within this Administrative Unit, use the tables below to summarize any unfunded resource requests. These requests should only be for needed items that cannot be funded out of your existing AU budgets. Refer to the Operations Planning Committee website: <http://foothill.edu/president/operations.php> for current guiding principles, rubrics and resource allocation information.

Full Time Faculty and/or Staff Positions

Position	\$ Amount	Related Goal from Table in section 3.2 and/or rationale
PT Admin Assistant	\$26,000/yr	# 3,4 & 5
Reclassify Sr System Admin	???	# 1

Unbudgeted Reassigned Time (calculate by % reassign time x salary/benefits of FT)

Position	\$ Amount	Related Goal from Table in section 3.2 and/or rationale
CHEM HAZMAT COORDINATOR	\$9,000/year	# 1,2 3 & 5

One-time B Budget Augmentation

Description	\$ Amount	Related Goal from Table in section 3.2 and/or rationale

Ongoing B Budget Augmentation

B Budget FOAP	\$ Amount	Related Goal from Table in section 3.2 and/or rationale
Required software licenses	\$12,000/year	# 1,2 & 4 May use Lottery since for students
		Joe Moreau said ETS would pay for VmWare licenses; not requested from FH.

Facilities and Equipment

Facilities/Equipment Description	\$ Amount	Related Goal from Table in section 3.2 and/or rationale
Dual projector screens & console in 4201 and 4301 to make more flexible.	\$45,000	# 1

Section 5: Program Strengths/Opportunities for Improvement

5.1 Address the concerns or recommendations that were made in prior program review cycles.

5.2 What statements of concern have been raised in the course of conducting the program review?

1. **PSME is stretched because of the various initiatives (see in strengths)**
 - a. Ruyu has to juggle many administrative balls as well as deal with constant questions and concerns from students.
 - b. System Admins have needed to learn new skills and have been pushed with keeping up. Students and faculty need access 24 x 7 to the PSME servers.
 - c. Faculty struggle to identify how to revolutionize how they teach chemistry, computer science, engineering, mathematics and physics. Real change requires additional FT faculty to permit time to innovate while providing adequate coverage in classes.
 - d. The Dean relies on the staff and faculty to take on additional responsibilities to ensure the division functions. This is becoming an issue without reassign time.
2. **The computer technology requires ETS support (see in strengths #6):**
 - a. PSME has taken responsibility to reimage all of the computers in 4200, 4300, 4500, 4600, 4700, 4800, 5500 and will do 5600.
 - b. The cost of the server and infrastructure is expensive and should be covered by ETS: servers, VmWare, UniDesk, Deep Freeze, OS + maintenance and SSL certificates.
 - c. To provide 24 x 7 support, it would be a benefit if ETS staff were trained and available as back up.
 - d. Need to support innovation and reduce the cost of educational technology.
3. **Renovation of 5600. Concern is all of the issues with prior 5500 renovation and oversight.**
 - a. Ensure the construction matches the design
 - b. Identify the furniture
 - c. Identify the instructional and student technology
4. **FH's ability to take STEM to the next level (5 & 6 in strengths)**
5. **FHDA support to making FH facilities and resources available to making the campus a living laboratory. The need to transition to an instructional element of the college.**
6. **The proper assessment of student skills for placement and adequate STEM counseling. The STEM options are very wide ranging and students often don't understand them.**

5.3 After reviewing the data, what strengths or positive trends would you like to highlight about your Administrative Unit?

1. **The main strength is the quality of the faculty and staff. PSME is a leader in educational innovation as well as excellence in education takes exceptional people. The faculty and staff are very collegial and make decisions by consensus.**

2. **PSME students are actively recruited for transfer by top tier colleges. Degreed students and full time employed students take courses to up-skill their existing ones.**
3. **Faculty and staff support all three core college missions and has been a campus leader in Basic Skills.**
4. **PSME Division continues to grow in enrollment, even with college enrollment declining.**
5. **PSME has a large number of initiatives running in parallel:**
 - a. **STATway, new basic skills pathway**
 - b. **STEMway, STEM student retention and success NSF grant.**
 - c. **Nanotechnology NSF grant update for HS and grant with NASA/ASL**
 - d. **Submitted NSF/S-STEM proposal for \$500K in STEM scholarships / 5 years. If awarded will start in 13F**
 - e. **Math Faculty is working with Steve Cooper at Stanford on NSF/ATE proposal to develop automated system to generate questions based on a a learning hierarchy for calculus. Ask Ion. (Total \$900K, FH \$200-300K)**
 - f. **Amanda Norick has \$30K grant for STEM teacher scholarships**
 - g. **Math Dept to redefine the Algebra and Calculus sequence**
 - h. **Sustainability & Energy Program; create degree, develop internships, articulation agreements and grants**
 - i. **Chemistry undergraduate research & new courses**
 - j. **Support to YearUp**
 - k. **FH's Science Learning Institute (SLI)**
 - l. **Expand CS Dept course offerings**
6. **PSME commitment to educational technology:**
 - a. **Develop and operate PSEC data server center**
 - b. **Continue to investigate instructor devices; tablets & software (i.e. Ubiquitous Presenter)**
 - c. **Deploy Virtual software to student and faculty devices**
 - d. **Virtualize CS student labs to permit flexibility**
 - e. **Create student success data dictionary for retention**
 - f. **Implement STEMway under Blackboard LMS**
 - g. **Maintain software and reimaging of PSME classroom and Lab computers**
 - h. **Procure new lab equipment to keep pace with 4 year colleges**
 - i. **Use of MOOCs and flipped classrooms**

Section 6: Feedback and Follow Up

This section is for the Vice President and/or President to provide feedback.

6.1 Strengths and successes of the program as evidenced by the data and analysis:

The PSME division demonstrates above and beyond academic excellence and innovation. The faculty, staff and administration are very student centered, and are dedicated to serving our students through high quality instruction and support in basic skills, workforce, transfer, as well as training and retraining. The courses are scheduled to meet student's needs, and there is a strong emphasis on using technology as a bridge to advance pedagogy.

The division is highly active in partnerships, fundraising, and experimental programs and contributes greatly to the excellent reputation that Foothill College holds.

6.2 Areas of concern, if any:

This program review highlights the many goals and projects that are ongoing in the division, and the concern about sustainability of these efforts. It would be helpful to more clearly delineate what specific resources are needed to better support these efforts, and to identify them in a prioritized fashion. The resource requests look fairly clear; however, the narrative does not.

Also, there is clearly frustration with regards to paper work and processes. It would be best to identify exactly which “bureaucratic” requirements are the most onerous, as well as distinguish between those that are required, whether by the CCCCCO, accreditation, etc. and those over which the college has control, in order to best assist the division with these demands.

6.3 Recommendations for improvement:

None.

6.4 Recommended next steps:

Proceed as planned on program review schedule

Further review/Out of cycle in-depth review