BASIC PROGRAM INFORMATION

Program Review is about documenting the discussions and plans you have for improving student success in your program and sharing that information with the college community. It is also about linking your plans to decisions about resource allocations. With that in mind, please answer the following questions.

Department Name: General Studies: Science

Division Name: BHS & PSME

Please list all team members who participated in this Program Review:

Name	Department	Position
Victor Tam	PSME	Division Dean
Nanette Solvason	BHS	Division Dean

Number of Full Time Faculty: 55+   **Number of Part Time Faculty:** 80+

Please list all existing Classified positions: *Example: Administrative Assistant I*

Ruyu Chen, Administrative Assistant
Anna Wu, Chemistry Lab Technician
Sherman Lee, Chemistry Lab Technician (evening)
Jenny Liang, Physics/Engineering Lab Technician
Mario Ramos, Systems Administrator
Luis Barreto, Systems Administrator

List all programs covered by this review and indicate the program type:

General Studies - Science   ☐ Certificate   ☒ AA / AS   ☐ AD-T   ☐ Pathway

SECTION 1: PROGRAM DATA & ENROLLMENT

1A. Transcriptable Program Data: Data will be posted on Institutional Research's website for all measures except non-transcriptable completion. You must manually copy data in the boxes below for every degree or certificate of achievement covered by this program review.

Transcriptable Program	2012-2013	2013-2014	2014-2015
General Studies - Science	20	17	35

1B. Non-Transcriptable Program Data: Please provide any non-transcriptable completion data you have available. Institutional Research does not track this data; you are responsible for tracking this data.

Non-Transcriptable Program	2012-2013	2013-2014	2014-2015

Please provide the rationale for offering a non-transcriptable program and share the most recent program completion data available.

1C. Department Level Data:

	2012-2013	2013-2014	2014-2015
Enrollment	8074	8494	8446 (-0.6%)
Productivity	519	516	504 (-2.3%)
Course Success	68%	69%	69%
Full-Time Load (FTEF)	30.1	31.4	31.6
Part-Time Load (FTEF)	36.9	42.1	43.2

1D. Enrollment Trend:
Program Enrollment (Over Past 3 Years): ☒ Increase ☐ Steady/No Change ☐ Decrease

1E. Course Success Trends: Please describe course success trends for the following student groups and compare the program-level data with the college-level data.

	Program-Level Trend			**College-Level Comparison**		
	Increase	Steady/No Change	Decrease	Above	At Level	Below
African American	☐	☒	☐	☐	☐	☒
Asian	☐	☒	☐	☐	☐	☒
Filipino	☐	☒	☐	☐	☐	☒
Latino/a	☐	☒	☐	☐	☐	☒
Native American	☐	☐	☒	☐	☐	☒
Pacific Islander	☐	☒	☐	☐	☐	☒
White	☒	☐	☐	☐	☐	☒
Decline to State	☐	☒	☐	☐	☐	☒

1F. Course Success Demographics: Please compare the program-level course success rate data for the following student groups with the college-level data.

Male: ☐ Above Level ☐ At Level ☒ Below Level
Female: ☐ Above Level ☐ At Level ☒ Below Level
<25 Years Old: ☐ Above Level ☐ At Level ☒ Below Level
>25 Years Old: ☐ Above Level ☐ At Level ☒ Below Level

1G. Equity: One of the goals of the College's Student Equity plan is to close the performance gap for disproportionately impacted students, including African-American, Hispanic/Latino, and Filipinos/Pacific Islanders. If the course success rates for these students (or other groups not listed above, such as foster youth, veterans, and students with disabilities) is below that of the College, what is your program doing to address this?

The analysis of the General Studies Science (GSS) Program is an aggregate of BHS & PSME courses listed in the Curriculum Sheet. It should be noted that a majority of students who earn this Degree do not take most of the higher-level courses listed; therefore, an average of course success rates from all potential courses that a student could take to earn the AS Degree is not an accurate representation of success rates for this Program. Notwithstanding, the number of AS Degrees issued saw a 100% jump from the previous year (17 to 35), and has been on an upward trend based on the past three years. Specific equity initiatives can be found in the multiple Program Review documents for each department involved as well as the administrative PRs for both the BHS & PSME Divisions. A few initiatives to highlight that have been a collaboration between both Divisions include the following: a) STEM Center and STEM Foundations Lab; b) Women in Tech Workshop; and c) STEM Day.

The STEM Center is a tutorial center staffed by supplemental instructors (individuals with BS or higher

degrees in the sciences and math) where students can go to receive assistance with their coursework. All students enrolled in a PSME and BHS class may utilize the Center.   Many students in disproportionally impacted populations balance work and family issues and need scheduling flexibility. Hours have been expanded to later in the evening (8 PM) as well as on weekends (Saturdays, 10 AM - 4 PM) to accommdate students' work and class schedules. Online tutoring to support the large amount of virtual students enrolled in Computer Science classes has expanded from a few hours on weeknights, to Sundays (12P - midnight), and weekdays (8 PM - midnight). The STEM Foundations Lab provides assistance geared primarily to students enrolled in pre-collegiate math courses, which traditionally have a higher percentage of disproptionally impacted students. Here, students receive one-on-one tutoring with no time limits by supplemental instructors trained in assiting students who have struggled with math concepts.

Over the summer, both BHS & PSME faculty attended the Women in Tech workshop, which provided information and a forum for discussion to address the gender gap in the sciences. Information included how to market STEM courses to women, how to increase retention, and techniques that could be implemented directly in the classroom. Follow-up conference calls are occurring over the current academic year.

STEM Day, which occurs one week prior to the start of Fall Quarter, involved both BHS & PSME faculty. During the event, students can meet with discipline faculty and ask both academic and professional questions. The goal of the event is to break down any communication barriers that may exist between instructor and student, and erase the stereotype of faculty as simply talking heads behind a lectern. Studies have shown that students in disproportionally impacted populations have higher success rates when faculty take an interest in both their academics and non-academic issues. This event helps to start those conversations and form connections.

1H. Course Enrollment: If there are particular courses that are not getting sufficient enrollment, are regularly cancelled due to low enrollment, or are not scheduled, discuss how your program is addressing this.

Nearly all courses in the GSS Program are offered at least once each year, if not most being offered each quarter, since most are also a part of popular science UC/CSU transfer programs. In the engineering department, a handful of classes are currently undergoing deactivation since they have never been offered and will also be removed from the GSS Program. These courses include ENGR 81 (Eletric Power Systems), ENGR 82 (Photo Voltaic & Solar Cell Design), ENGR 83 (Smart Energy Systems), ENGR 102 (Building Science & Performance Engineering), ENGR 25 (Introduction to Fresh Water), and ENGR 39 (Energy, Society & the Environment). In computer science, CS 85A (Ruby & Functional Programming) has yet to be taught as a qualified faculty member has not been identified.

1I. Productivity: Although the college productivity goal is **535**, there are many factors that affect productivity (i.e. seat count / facilities / accreditation restrictions).

Program Productivity Trend: ☐ Increase ☒ Steady/No Change ☐ Decrease
Program Productivity (Compared to College): ☐ Above Goal ☐ At Goal ☒ Below Goal

Please discuss what factors may be affecting your program's productivity.

A majority of the courses in the GSS Program contain a lab component which limits the class size due to safety and facility issues. Since class size is mandated to be smaller, the productivity of the GSS program will remain lower than the College productivity goal (535). The GSS Program has a 3-year average of 513

and has been holding steady, with only a slight decrease in the past year.

If your program's productivity is below that of the College, please discuss your program objectives aimed at addressing this.

Lower productivity science lab courses are essentially subsidized by higher productivity non-lab courses in computer science and mathematics. With the increase in class size in transfer-level math courses in the 2015-2016 AY, this should cause an increase in productivity. Additionally, computer science maintains a strong positive growth trend. As more high-productivity CS courses are offered, this will help to increase the GSS program productivity overall.

SECTION 2: COURSE COMPLETION & PROGRAM IMPROVEMENT

2A. Institutional Standard: This represents the lowest course completion (success) rate deemed acceptable by the College's accrediting body (ACCJC). The institutional standard is **55%**.
Program Level Course Completion: ☒ Above Standard ☐ At Standard ☐ Below Standard
Targeted Student Course Completion: ☒ Above Standard ☐ At Standard ☐ Below Standard
Online Student Course Completion: ☐ Above Standard ☐ At Standard ☒ Below Standard
In-Person/Hybrid Course Completion: ☒ Above Standard ☐ At Standard ☐ Below Standard

2B. Institutional Effectiveness (IEPI) Goal: This represents an aspirational goal for course completion (success) rates; all programs should strive to reach/surpass this goal. The IEPI goal is **71%**.
Program Level Course Completion: ☐ Above Goal ☐ At Goal ☒ Below Goal
Targeted Student Course Completion: ☐ Above Goal ☐ At Goal ☒ Below Goal
Online Student Course Completion: ☐ Above Goal ☐ At Goal ☒ Below Goal
In-Person/Hybrid Course Completion: ☐ Above Goal ☐ At Goal ☒ Below Goal

Please comment on your program's efforts to continually improve course completion (success) rates, especially for students with basic skills needs.

Math proficiency is crucial and a strong predictor of success in associated science classes. The Math Department is currently investigating different techniques to help with success in their courses, include mindset intervention and exploring/developing new math courses that differ from the traditional algebra pathway. The Math Department has also collaborated with the campus-wide Early Alert Program to provide intervention to students enrolled in Math 220 an Math 105 (both basic skills courses) as well as transfer-level Math 1A, due to the lower course success rates in these classes. Additionally, the Basic Skills Workgroup is funding a one-on-one tutorial program for students who have failed Math 105 twice. Since Math 105 is the gatekeeper for multiple majors, BSW felt that additional support was necessary for this vulnerable population.

If your program's course completion (success) rates are below the institutional standard (see above), please discuss your program objectives aimed at addressing this.

The GSS Program is near the institutional standard (69% 3-year average), with most classes at or near standard. Online CS classes and pre-collegiate math courses have lower success rates and also have an overweight effect on the average due to the large number of sections offered. As mentioned above, increasing online tutoring to CS classes as well as implementing a variety of initiatives in the math department may potentially raise the overall course success rate for the GSS program.

2C. Faculty Discussion: Does meaningful dialogue currently take place in shaping, evaluating, and assessing your program's Student Learning Outcomes (SLOs)? ☒ Yes ☐ No

Does meaningful dialogue currently take place around equity and course success rates? ☒ Yes ☐ No

If yes, in what venues do these discussions take place? (Check all that apply)
☒ Department Meetings ☒ Opening Day ☐ Online Discussions ☐ Other:

If no, please discuss what is missing and/or the obstacles to ensuring meaningful dialogue takes place.

2D. Course-Level: How has assessment and reflection of course-level Student Learning Outcomes (CL-SLOs) and course completion data led to course-level changes?

See respective Departments for CL-SLOs.

If your program's CL-SLOs are not being met, please indicate your program objectives aimed at addressing this.

2E. Program-Level: How has assessment and reflection of program-level Student Learning Outcomes (PL-SLOs) led to certificate/degree program changes and/or improvements?

See respective Departments for PL-SLOs.

What is being done at the program-level to assist students in achieving degree/certificate completion and/or transferring to a four-year institution?

See respective Departments for PL-SLOs.

If your department has a Workforce/CTE program, please complete Section 2F.
If your department does not have a Workforce/CTE program, please skip to Section 3.

2F. Workforce/CTE Programs: Refer to the program review website for labor market data.

What is the regional three-year projected occupational growth for your program? | N/A |

What is being done at the program-level to assist students with job placement and workforce preparedness?

N/A

If your program has other program-level outcomes assessments (beyond SLOs and labor market data), discuss how that information has been used to make program changes and/or improvements.

N/A

SECTION 3: SUMMARY OF PROGRAM OBJECTIVES & RESOURCE REQUESTS

3A. Past Program Objectives: Please list program objectives (not resource requests) from past program reviews and provide an update by checking the appropriate status box.

No previous PR	Year:	☐ Completed	☐ Ongoing	☐ No Longer a Goal

Please comment on any challenges or obstacles with ongoing past objectives.

Please provide rationale behind any objectives that are no longer a priority for the program.

3B. New Program Objectives: Please list all new program objectives discussed in Sections 1-2; do not list resource requests in this section.

Program Objective	Implementation Timeline	Progress Measures
Example: Offer 2 New Courses to Meet Demand	*Winter 2016 Term*	*Course Enrollment*
Provide additional professional development to support faculty tackle the achievement gap	Year Round	Setting dates for PD events; list of best practices as a resource for faculty; increase in success rates
Coordinate multiple equity initiatives within the sciences	Year Round	Cross-discipline faculty collaborations in STEM; compile list of initiatives with positive results
Increase online course success rates	Year Round	Plan multiple meetings regarding online education best practices; review course websites with instructional designer

3C. EMP Goals. Please refer to the Educational Master Planning (EMP) website for more information. Indicate which EMP goals are supported by your program objectives (Check all that apply).
☒ Create a culture of equity that promotes student success, particularly for underserved students.
☐ Strengthen a sense of community and commitment to the College's mission; expand participation from all constituencies in shared governance.
☒ Recognize and support a campus culture that values ongoing improvement and stewardship of resources.

3D. Resource Requests: Using the table below, summarize your program's unfunded resource requests. Refer to the Operations Planning Committee (OPC) website for current guiding principles, rubrics and resource allocation information. Be sure to mention the resource request in your narrative above when discussing your program so the request can be fully vetted.

Resource Request	$	Program Objective (Section 3B)	Type of Resource Request			
			Full-Time Faculty/Staff Position	One-Time B-Budget Augmentation	Ongoing B-Budget Augmentation	Facilities and Equipment
STEM Success Coordinator	$80K + benefits	1, 2, 3	☒	☐	☐	☐

3E. Unbudgeted Reassigned Time: Please list and provide rationale for requested reassign time.

N/A

3F. Please review the resource requests that were granted over the last three years and provide evidence that the resource allocations supported your objectives and led to student success.

N/A

SECTION 4: PROGRAM SUMMARY

4A. Prior Feedback: Address the concerns or recommendations made in prior program review cycles, including any feedback from the Dean/VP, Program Review Committee (PRC), etc.

Concern/Recommendation	Comments
No previous PR.	

4B. Summary: What else would you like to highlight about your program (e.g. innovative initiatives, collaborations, community service/outreach projects, etc.)?

SECTION 5: LEARNING OUTCOMES ASSESSMENT SUMMARY

5A. Attach 2014-2015 Course-Level Outcomes: Four Column Report for CL-SLO Assessment from TracDat. Please contact the Office of Instruction to assist you with this step if needed.

5B. Attach 2014-2015 Program-Level Outcomes: Four Column Report for PL-SLO Assessment from TracDat. Please contact the Office of Instruction to assist you with this step if needed.

SECTION 6: FEEDBACK AND FOLLOW-UP

This section is for the <u>Dean/Supervising Administrator</u> to provide feedback.

6A. Strengths and successes of the program as evidenced by the data and analysis:

This is an outstanding transfer degree that serves many students in the sciences. The degree exists as an option for students who want to transfer to a university with a general degree in the sciences.

6B. Areas of concern, if any:

Since this degree crosses many disciplines in the sciences and two divisions at Foothill, there is no real faculty ownership in terms of developing program learning outcomes and in terms of writing this program review.

6C. Recommendations for improvement:

The Deans in the area should engage with the faculty comprising these disciplines and work with the Academic Senate to come up with a plan to have faculty ownership of this degree and to have program learning outcomes developed that can be measured.

6D. Recommended Next Steps:

X   ☐ Proceed as Planned on Program Review Schedulenned on Program Review Schedule

        ☐ Further Review / Out-of-Cycle In-Depth Review

Upon completion of Section 6, the Program Review document should be returned to department faculty/staff for review, then submitted to the Office of Instruction and Institutional Research for public posting. Please refer to the Program Review timeline.

Unit Assessment Report - Four Column

Foothill College

Program (Interdisciplinary) - General Studies Science AS

Primary Core Mission: Transfer

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Program (Interdisciplinary) - General Studies Science AS - 1 - Upon successful completion of the General Studies: Science program, students will be able to integrate the various fields of science in order to critically evaluate and interpret scientific information **SLO Status:** Active	**Assessment Method:** Students with the declared major in General Studies Science will be invited to participate in a focus group to assess their overall understanding of the different fields of science **Assessment Method Type:** Interviews/Focus Groups **Target:** the majority of students will be able to critically evaluate and interpret scientific information.		
Program (Interdisciplinary) - General Studies Science AS - 2 - Upon successful completion of the General Studies: Science program, students will be able to assess how relevant scientific information could be used to inform their own personal economic, political and social decisions **SLO Status:** Active	**Assessment Method:** Students in the major will be invited to participate in a survey that will evaluate how their increased understanding of science will influence their decision making processes related to economics, politics and social decisions. **Assessment Method Type:** Survey	08/27/2012 - Surveys were sent out to 22 students who were reported as completing the AS General Sciences Degree in the 2011-2012 academic year. Only 3 replied and while the replies were generally positive, the overall outcomes are not very meaningful due to the low response rate. **Result:** Target Not Met **Year This Assessment Occurred:** 2011-2012 **Related Documents:** GS_Science PSLO survey 2012.pdf	08/27/2012 - I am not sure how to increase the response rate. Perhaps sending out the surveys mid-quarter in the Spring would increase the rate. Also, next year (2012-2013) we will have the surveys sent out from the Research office, which may or may not help.