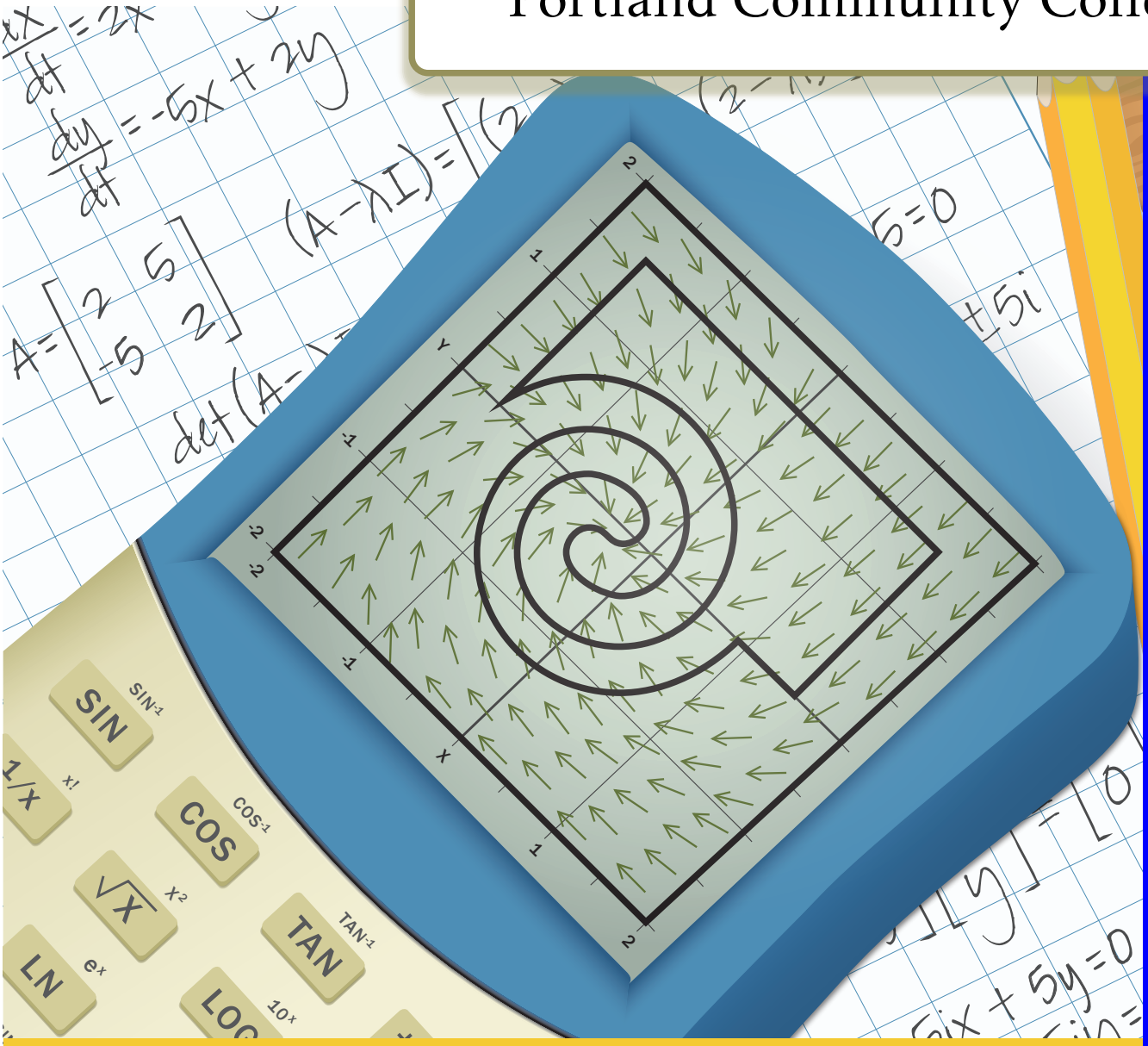
Program Review

Mathematics

Portland Community College



MATHEMATICS

Fall 2008–Spring 2013

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Faculty: reflect on the composition, qualifications and development of the faculty

A. *Provide information on each of the following*

Quantity and quality of the faculty needed to meet the needs of the program or discipline.

The total number of full time faculty at all campuses between 2011 and 2013 varied between 36 to 41 and the part time faculty varied between 143 to 158 on any given term, not including Summer. The percent of *all* courses (pre-college and college level) taught by full-time instructors during this time period varied from a low of 24.9% at Cascade to a high of 41% at Sylvania (see Table 5.1).

From the academic year 2008 to 2012 there was a significant increase in the number of students taking math courses at all campuses as shown Table 5.2.

TABLE 5.1: Percentage of courses taught by full-time faculty from Summer2011–2013

⟨reflect:tab:enrollment⟩

⟨courses⟩

SY	RC	ELC	CA
41%	28.2%	26%	24.9%

TABLE 5.2: Enrollment Difference from AY 08 to AY 12

Campus	Enrollment Difference	% increase
SY	5277	48.59%
CA	3666	64.82%
RC	5333	55.87%
ELC	3171	103.09%

Table 5.3 summarizes the breakdown of courses taught by full-time and part-time faculty from Summer 2011–Spring 2013; breakdowns for each of these terms are given in appendix J on page 80.

In reference to "quality of the faculty needed to meet the needs of the discipline," it is insufficient to look at degree or experience qualifications alone. Even a short list of what we expect from our mathematics faculty would include, but not be limited to that she/he:

- possess an understanding of effective mathematics teaching methodologies and strategies, and be able to adjust in response to student needs
- teach the course content as outlined in CCOGs and with the appropriate mathematical rigor

- show genuine commitment to students' success
- identify problems when students encounter difficulties learning
- demonstrate an ongoing intellectual curiosity about the relationship between teaching and learning
- manage classroom learning environments and effectively handle student discipline problems
- demonstrate technological literacy needed in the teaching of mathematics
- participate in professional organizations
- develop, evaluate and revise the mathematics curricula
- serve and contribute to the PCC community as a whole through campus and district wide committees and activities

In addition, with the enormous enrollment increases of the past several years, there are more students than ever needing both remediation in mathematics and guidance in general about what it takes to be a successful college student.

Addressing this section heading directly, the 'quantity' of full-time faculty needed to achieve the 'quality' goals noted above is currently inadequate. It is primarily the full-time faculty that has the time, resources and institutional support to fully realize the expectations noted above. Part-time faculty are dedicated, but the expectations are different given their compensation. To increase the probability that a student moves successfully through our mathematics courses without sacrificing quality, having a larger full-time faculty presence than currently exists would help with this goal.

In recognizing the need for more full-time faculty, we do not want to downplay the skills and talents of our part-time faculty. We have approximately 150 part-time instructors that serve our students each term many of whom have teaching experience from other colleges and universities; they bring additional experiences from industry, other sciences, high school and middle school education, and so much more. Since they teach such a high percentage of our classes, their success is crucial to our students' success.

Recommendation: given PCC's limited resources, the MTH SAC welcomes the input of the

TABLE 5.3: Summary of sections taught (by campus) from Summer 2011–Spring 2013

pp:tab:analysisPTFT⟩

		Below 100 level	%	Above 100 level	%	Total	%
Cascade	Full-Time	88	21 %	62	36 %	150	25 %
	Part-Time	341	79 %	112	64 %	453	75 %
	Total	429		174		603	
Sylvania	Full-Time	132	21 %	171	43 %	303	29 %
	Part-Time	511	79 %	228	57 %	739	71 %
	Total	643		399		1,042	
Rock Creek	Full-Time	80	12 %	143	38 %	223	22 %
	Part-Time	561	88 %	231	62 %	792	78 %
	Total	641		374		1,015	
South East	Full-Time	65	23 %	26	42 %	91	26 %
	Part-Time	223	77 %	36	58 %	259	74 %
	Total	288		62		350	

administration to help us prioritize our various needs and find/develop targeted and effective professional development for as many faculty members as possible, including part-time faculty.

Extent of faculty turnover and changes anticipated in the next five years.
Since 2011, ten full-time instructors have been hired and eleven full-time instructors have left campuses across the district. Of the eleven full-time instructors who left, five retired, one left to pursue other job opportunities, and one returned to another teaching job after the term of the PCC position ended. Three of the retirements occurred at Sylvania and one each at Rock Creek and Cascade. Four full-time instructors left one campus in order to work full-time at another campus. There was one transfer from Cascade to Rock Creek, one from Cascade to Sylvania, one from Rock Creek to Cascade, and one from Rock Creek to Sylvania. In the next five years, similar turnover with full-time faculty is expected.

Since 2011, 53 part-time instructors have been hired and 35 part-time instructors have left campuses across the district. Of the three campuses, Rock Creek has the most part time faculty turnover, followed by Cascade and Sylvania. Reasons for leaving varied, but at least eight of the part-time instructors who left campuses simply moved to another campus in the district (see appendix K on page 83).

Extent of the reliance upon part-time faculty and how they compare with full-time faculty in terms of educational and experiential backgrounds.
Across the district, the mathematics departments rely heavily upon part-time faculty to teach the majority of the math classes offered. Between 2011 and 2013, 75.1% of the classes at Cascade were taught by part-time instructors, 71.8% at Rock Creek, 72.7% at Southeast, and 59% at Sylvania. This reliance on part-time faculty to teach classes has been a challenge to the departments in a number of ways. First, the turnover of part-time faculty is higher and thus there is a need to orient new employees more frequently and provide mentoring and guidance to them as well. Second, many part-time faculty are on campus only to teach their courses, and thus often do not attend meetings and keep up with current SAC discussions on curriculum. For these reasons, classes have a higher probability to be taught with less consistency than the mathematics SAC would like. Increasing the number of full-time faculty (and thus decreasing the dependence on part-time faculty) would mitigate much of this inconsistency (see appendix J on page 80).

Part-time faculty educational backgrounds vary much more than the full-time faculty backgrounds. Full-time instructors have master's or doctorate degrees in mathematics or related fields with extensive math graduate credits. About a quarter of the part-time instructors have bachelor's degrees and the rest have either a master's or doctorate degree. The part-time instructors come from a variety of employment backgrounds and have different reasons for working part-time. They may be high school instructors (active or retired), may come from a household in which only one member is working full time while the other teaches part time, may be recently graduated MS or MAT students seeking full time employment, may be working full time elsewhere in a non-educational field, or may be retired from a non-educational field (see appendix K on page 83).

How the faculty composition reflects the diversity and cultural competency goals of the institution.
The mathematics SAC is deeply committed to fostering an inclusive campus climate at each location that respects all individuals regardless of race, color, religion, ethnicity, use of native language, national origin, sex, marital status, height/weight ratio, disability, veteran status, age, or sexual orientation. Many of these human characteristics noted above are not measurable

nor necessarily discernible. However, PCC does gather data on gender and race/ethnicity, as detailed in Table 5.4 (see also the extensive demographic data displayed in appendix P on page 112).

TABLE 5.4: Racial/Ethnic Make-up of PCC Faculty and Students

:racialethnicmakeup⟩

	PT Faculty	FT Faculty	Students
Male	54.1%	53.2%	55%
Female	45.9%	47%	45%
Asian /Pacific Islander	7.7%	6.4%	8%
Black or African American	1.1%	0.0%	6%
Hispanic/Latino	2.2%	4.3%	11%
Multiracial	1.1%	0.0%	3%
Native American	0.0%	0.0%	1%
Unknown/International	12.2%	4.3%	3%
Caucasian	75.7%	85.1%	68%

Our SAC will continue to strive toward keeping our faculty body ethnically diverse and culturally competent, but it is an area where improvement is needed. In terms of hiring, it has been well documented that there is a shortage of minorities in the Science, Technology, Engineering and Mathematics (STEM) undergraduate and graduate programs, which makes our recruitment of minority faculty difficult.

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Possible recommendations for Program Review:

- Math chairs and deans should strongly recommend that full-time faculty attend workshops related to diversity and cultural competency issues.
- Departments should be encouraged to provide diversity/cultural competency training for part-time faculty as part of their contractual meeting requirements.
- Hiring committees need to work with HR to identify and aggressively target mathematics graduate programs in the Northwest with minority students who are seeking teaching positions in community colleges.
- Departments on all campuses should increase efforts to find candidates for the Faculty Diversity Internship Program [2].

B.

Report any changes the SAC has made to instructor qualifications since the last review and the reason for the changes.

In Spring 2011, prompted by the transfer of Math 20 from Developmental Education (DE) to the Mathematics SAC, the math instructor qualifications were changed. Math 20 had been the only remaining mathematics course in the DE SAC.

The transfer included transitioning three full-time math DE math instructors at Sylvania into the Math Department at Sylvania. At this time, instructor qualifications for math faculty were examined and changed to reflect the inclusion of DE math faculty. It was determined that separate qualifications should be written for pre-college and college level courses. These qualifications were written so that all of the full-time DE math faculty transitioning into the math department (as well as any new DE math faculty hired) were qualified to teach the pre-college level courses and any new math faculty were qualified to teach all of the math courses.

For instance, a masters degree in mathematics education (instead of just mathematics) was included as an optional qualification for full-time instructors teaching pre-college level courses. Also a masters degree in mathematics education became an option for part-time instructors teaching MTH 211–213 (the sequence for elementary education math teachers). Additionally, at the request of the administration, the terms 'part-time' and 'full-time' were removed from instructor qualifications in order to satisfy accreditation requirements. Instead of labeling what had traditionally been part-time qualifications as 'part-time,' these qualifications were labeled 'Criteria for Provisional Instructors.'

In Winter 2013, the math instructor qualifications were again changed. This time at the request of the math department chairs. The 'provisional' labeling from the last revision had required math department chairs to regularly re-certify part-time ('provisional') instructors. In order to avoid this unnecessary paperwork, the SAC adopted a three-tiered qualification structure based on full-time, part-time, and provisionally-approved part-time instructors (mainly graduate students currently working on graduate degrees). The part-time (non-provisional) tier was labeled 'Demonstrated Competency.' Complete details are given in appendix Q on page 118.

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FIX

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Instructor Qualifications

sec:instructorquals⟩

Mathematics Instructor Qualifications (prior to May 2011)

Master degree (MA or MS) in mathematics from an accredited college or university. Or, a graduate degree in a related field with successful completion of at least 30 quarter credits of graduate level mathematics courses.

There are three alternative approval paths for part-time MTH instructors.

1. PSU Mathematics Graduate Students with 27 or more Graduate-level Credits in Mathematics: Any MTH course appropriate for the graduate student, i.e., it's not limited to certain courses. Approved many years ago by then VP for Academic Services Jim Van Dyke, we're allowed to hire PSU mathematics grad students who have completed 27 or more credits of graduate-level MTH courses. This path was worked out as part of a cooperative program with PSU's Mathematics Department. It gives us access to instructors and gives PSU grad students an opportunity to see if teaching is a good career fit.

2. For Teaching MTH 30 through MTH 95: Approved several years ago by the MTH SAC, instructors may teach MTH 30 through MTH 95 provided they have the following credentials.

   - Bachelor degree in Mathematics or Mathematics Education or in Education with an emphasis in mathematics. (Note; Bachelor degree in Business math be substituted for instructors of MTH 30.) AND

   - Three years full-time (or equivalent cumulative part-time) mathematics teaching experience within grades 7 through 16. AND

   - Transcript showing successful completion of a full calculus sequence.

3. Masters degree in a related field such as, but not limited to, Physics or Engineering: Any MTH course appropriate for the instructor, i.e., it's not limited to certain courses. Approved this year by the MTH SAC, individuals may demonstrate competency by having a Masters degree in a related field including, but not limited to, Physics or Engineering. The rationale behind this approval path is that folks with Masters degrees in Physics or Engineering, and other fields, have many math-intensive graduate-level courses in their discipline.

Mathematics Instructor Qualifications (approved May 2011)

MTH 99 AND BELOW

Masters degree (MA or MS) in Mathematics or Mathematics Education from a regionally accredited college or university. Or a graduate degree in a related field [1], such as, but not limited to, Physics or Engineering, with successful completion of at least 27 quarter credits of graduate level mathematics courses.

MTH 100 AND ABOVE

Masters degree (MA or MS) in Mathematics from a regionally accredited college or university. Or a graduate degree in a related field (as above), such as, but not limited to, Education, Physics, or Engineering, with successful completion of at least 27 quarter credits of graduate level mathematics courses.

Criteria for provisional instructors MTH 99 and below

1. Masters degree in a related field (as above) such as, but not limited to, Physics or Engineering; OR
2. Mathematics graduate students who are actively working on a degree (taking at least 1 credit per year) and have successful completion of at least 27quarter credits in graduate level Mathematics courses on their transcript; OR
3. Bachelor's degree in Mathematics or Mathematics Education or in Education with an emphasis in mathematics. (Note:Bachelor degree in Business may be substituted for instructors of MTH 30.) AND
   - Transcript showing successful completion of a full year of calculus. AND
   - Three years full-time (or equivalent cumulative part-time) mathematics teaching experience within grades 6 or above.

Criteria for provisional instructors MTH 100 and above

1. Masters degree in a related field (as above) such as, but not limited to, Physics or Engineering; OR
2. Mathematics graduate students who are actively working on a degree (taking at least 1 credit per year) and have successful completion of at least 27 quarter credits in graduate level Mathematics courses on their transcript; OR
3. Masters degree in Mathematics Education or Education may be substituted for instructors of MTH 211, MTH 212, and MTH 213.

Mathematics Instructor Qualifications (approved February 2013)

MTH 99 and below

1. Master's degree (MA or MS) in Mathematics or Mathematics Education from a regionally accredited college or university; OR
2. A graduate degree in a related field (as above), such as, but not limited to, Physics or Engineering, with successful completion of at least 30 quarter credits of graduate level mathematics courses.

[1] The applicability of a particular degree as 'a related field' will be determined by an appropriate Division Dean in consultation with a Mathematics Faculty Department Chair.

MTH 100 and above

1. Master's degree (MA or MS) in Mathematics from a regionally accredited college or university; OR
2. A graduate degree in a related field (as above), such as, but not limited to, Education, Physics, or Engineering, with successful completion of at least 30 quarter credits of graduate level mathematics courses.

Demonstrated competency MTH 99 and below

1. Master's degree in a related field (as above) such as, but not limited to, Physics or Engineering; OR
2. Bachelor's degree in Mathematics or Mathematics Education or in Education with an emphasis in mathematics AND Transcript showing successful completion of a full year of calculus AND three years full-time (or equivalent cumulative part-time) mathematics teaching experience within grades 6 or above.
3. Bachelor's degree in Business may be substituted for instructors of MTH 30.

Demonstrated competency MTH 100 and above

1. Master's degree in a related field (as above) such as, but not limited to, Physics or Engineering; OR
2. Master's degree in Mathematics Education or Education may be substituted for instructors of MTH 211, MTH 212, and MTH 213.

Provisional approval MTH 99 and below

Mathematics graduate students who are actively working on a degree (taking at least 1 credit per year) and have successful completion of at least 27 quarter credits in graduate level Mathematics courses on their transcript.

Provisional approval MTH 100 and above

Mathematics graduate students who are actively working on a degree (taking at least 1 credit per year) and have successful completion of at least 27 quarter credits in graduate level Mathematics courses on their transcript.