INSTITUTIONAL ASSESSMENT REPORT

MATHEMATICS DEPARTMENT / 2012

Department's Relationship to the College Mission and Strategic Plan

In a paragraph or two, discuss how the department's work carries out the Mission and Strategic Plan.

As guided by the mission of the college, the Mathematics program and its faculty are *student centered, providing an accessible, quality experience meeting the diverse needs of the students and the community*. Classes are taught through a student-centered model, by instructors who demonstrate expertise in their field while guiding their students through participatory learning activities. Diversity within the community is addressed in several ways: through providing a Mathematics Laboratory, staffed by full time and adjunct instructors; by assisting students during office hours and review sessions; by accommodating accelerated students with college honors courses and dual credit high school courses; and with full-time faculty presence at all college locations (including JC Online), during the daytime, evening, and weekend, and during the summer schedule of courses. The inclusion of whole class, small group, and student-student and student-teacher activities in a *supportive learning environment*, and in addition, the provision of Mathematics Laboratory and office hour contacts *promote intellectual, social, and personal growth*. The comprehensive, *strong general education curriculum* provides Mathematics courses for both *college transfer and technical programs, preparing students to succeed in their careers, further their education, and prosper in a diverse world.* The department provides a mainstream sequence of general education Associate of Arts and Associate of Science courses from Basic Mathematics through College Algebra, which continues through Calculus III and Linear Algebra. The department also provides courses in pre-service teacher education and statistics, and Career and Technical Education courses such as Technical Mathematics and Dosage Calculations. The faculty members participate in ongoing assessment of students, programs and services by daily assessment during classroom interactions, through assessment of course outcomes using cross-section departmental assessment and analysis, and by monitoring the availability and use of the Mathematics Laboratory.

The department's efforts are aligned with the Jefferson College Strategic Plan, by the characteristics addressed above and through the following additional ways. First and foremost in the Plan is Student Learning. Readiness for learning has recently been addressed in a two-fold manner: through the recent revision to prerequisite scores for mathematics courses and by the college-wide inclusion of reading prerequisites. Consistency of assignments is being addressed by incorporating the My Math Lab online (internet-based) learning program within the Basic Mathematics course and throughout the Algebra sequence. The department has designed common online homework assignments for the algebra sequence of courses within the My Math Lab program. The program provides for flexibility through various online help features which address diversity in readiness, learning styles, and schedule needs (including 24/7 technical and tutorial support). Student learning is also fostered by the faculty participation in professional development on-campus and through state and national organizations, in order to continuously develop teaching skills and to impact student learning. Department members also participate in

leadership and support roles in standing committees that assure the integrity and support of the excellent student programs at Jefferson College.

The second category in the Strategic Plan is Student Support. In addition to the Mathematics Laboratory and other support mentioned above, the full time faculty supports students through regular contact with adjuncts. Assisting and supporting the part-time faculty brings about cohesion within the department and provides for consistent, high quality mathematics education.

The third component of the Plan addresses collaboration within the community. In addition to the traditional on-campus courses, the department provides online courses that meet the needs of local and remote in and out of state students, and dual credit high school courses. The annual spring mathematics contest brings together a community of talented 7 -12th grade students, and it provides a networking opportunity for their instructors and the college mathematics department faculty. Furthermore, the department has provided the means to share information with full time and adjunct faculty through a Mathematics Blackboard site. Also, the faculty members regularly develop the departmental community through discussions of issues of interest by means of e-mail and contact at the Mathematics Laboratory.

The fourth part of the Plan addresses Support for Employees. The effect of this administrative goal is evident through the persistence of both the full-time and the adjunct faculty members of the mathematics department, who have served the college for many years. The department includes some full and part time instructors who have served the college over twenty years. Full-time faculty members are granted professional leave time, in order to attend conferences and present workshops at state and national meetings.

The fifth component of the Plan is the intention to provide for Facilities and Infrastructure. The department's instructors well support the use of technology such as computer labs, Smart Boards, and Blackboard, and they teach courses at all locations including JC Online. Therefore, they utilize the technology that is provided and have a presence at all of the college locations.

The sixth component of the Strategic Plan is Financial Responsibility. Many mathematics courses are populated to capacity and/or overload, and many instructors teach the maximum amount of overload sections. These overload conditions maximize facility use, revenue, and the exposure to students to the full-time faculty. And as mentioned above, the faculty makes good use of the technology, facilities, and infrastructure.

The final component of the Plan is Assessment. As previously discussed, assessment is ongoing within the mathematics department. Informal assessment drives the classroom activities, as instructors respond to students during class sessions. Instructors assess test results, and address identified needs. Multi-section assessments are analyzed in order to improve instruction. Institution-wide assessment led to the expansion of Mathematics Laboratory hours to include for the first time this Fall 2012 term a full daily schedule of assistance at JC-Arnold in addition to the Hillsboro schedule, and the first expanded summer schedule during the Summer 2012 term.

As evidenced within in this section of the Institutional Effectiveness Review, the Mathematics Department supports the Mission and Strategic Plan of Jefferson College. In addition to the departmental community efforts to support the Jefferson College Mission and Strategic Plan mentioned above, the individual faculty contributions are documented on Annual Performance Reviews.

Summary of Departmental Activities, Assessment and Use of Results

Provide a brief overview of major accomplishments since the last review and how assessment results have been used to improve services/learning outcomes.

- Course faculty leaders: The department has designated two lead faculty members for each of the courses in the Algebra sequence. The lead faculty's responsibilities are to liaise with adjunct instructors teaching the course; advise them on issues such as levels of rigor, class policies, pacing of instruction, etc.; and to serve as contact persons within the department when questions or issues arise. This change was made to give the adjuncts someone to ask for advice and guidance other than the Division Chair to whom they report, and to provide a channel for regular communication and professional networking between the adjuncts and full-time faculty. The impact of this change has not been formally assessed, but adjunct instructors have consulted with the lead faculty, and they have been well satisfied with the results.
- BlackBoard Page: The department has created a "Mathematics Department" class in BlackBoard and has enrolled all full-time and adjunct instructors into the class. The class contains resources such as our Math Department Adjunct Handbook, sample class syllabi, objective outlines for our courses, etc. The discussion board feature is active as well to enable department-wide discussion of issues. This page was completed during the first few weeks of the Fall 2012 semester, so feedback has been limited to this point.
- Global My Math Lab (MML) Inclusion: In an effort to increase consistency across sections, the department has required all students in all sections (except for high school Dual-Enrollment sections) of the Algebra sequence to use Pearson's MML program, starting with the Fall 2012 semester. The full-time faculty held MML training sessions for adjunct faculty, and also created "master" courses for adjunct faculty to copy and use in their sections. These "master" courses serve three purposes: They save the adjunct instructors from having to build courses on their own; they ensure that all instructors are covering the same material, and they will facilitate future cross-sectional assessment efforts. Again with this change, it has been instituted too recently for us to have assessed its efficacy. The transition has gone smoothly, and all instructors seem to be on board with it.

  One thing that we in the department found pleasantly surprising was the large number of Dual-Enrollment instructors who attended the training and seemed enthusiastic about the MyMathLab program and the master course structure. This indicates to us that they are interested in collaborating more with the department. Including them more in these efforts is something we plan to do, but we need to first develop a strategy for dealing with a couple issues. Many Dual classes run for a full school year, which differs from our 8 to 16 week model. Also the MML access code costs in excess of $100 per individual student per class, whereas school-provided textbooks can be passed down for years. This expense may be an issue for some districts.

Internal and External Data Collection and Analysis

Gather and analyze relevant internal and external data (link to data).

We collected data designed to answer the following questions:

- What is the initial Mathematics course placement level of our new students?

  Our reason for looking at this is that we would like to establish a relationship with the High Schools in Jefferson County to hopefully improve their students' readiness for College level Mathematics. Before we can do this, we need to quantify and benchmark the current situation. The results were as follows:

Initial Mathematics Placement of Incoming Students

Course	Course Name	Percent of new students
MTH 001	Basic Math	21.9
MTH 002	Beginning Algebra	39.6
MTH 128	Intermediate Algebra	12.8
MTH 134	College Algebra	22.6
MTH 141	Pre-Calculus	4.2
MTH 180	Calculus I	2.8
Other	Statistics/Trigonometry/Structure of the Real Numbers/Business Calculus	12.8
Source: L:\Projects2\Acad_Dept\InstructionalProgramReview\2012_InstitutionalAssessment\Math\IA-2012-Math, Q-12 SATURN_SHRTCKN: PIDM, TERM_CODE=Between '200602' And '201103', SUBJ_CODE='MTH', CRSE_NUM SATURN_SHRTCKM: CRSE_NUMB=First		

These statistics reflect the initial MTH course at Jefferson College for 10,754 students who enrolled prior to Fall 2006. Not represented are the 14.2% of students who did not take any MTH class.

We did not find the results surprising, but disheartening that approximately 75% of our students come to Jefferson College not prepared for College level work in Mathematics. Our next step will be to request more detailed data for the intervening years and to see if there are any trends that we can identify that might inform our efforts to address this situation for the future.

- How does a student's grade in a pre-requisite course affect success in the subsequent course?

Our purpose here was to determine if our pre-requisites are ensuring an adequate level of preparedness for our courses. The wording of our actual request is too lengthy, but the question we were asking is, "What percent of students getting an A (or B or C) in a pre-requisite course get an A (or B or C, or F) in the subsequent course?" A summary of the results is shown in the following table.

Prerequisite Course Grade and Success in Subsequent Course

Pre-Requisite Course	**Grade**	**Percent Successful**	**Percent Unsuccessful**	**Subsequent Course**
MTH 001	A	81%	19%	MTH 002
	B	65.4%	34.6%	
MTH 002	A	89.5%	10.5%	MTH 128
	B	75.1%	24.9%	
	C	57.1%	42.9%	
MTH 128	A	91.3%	8.7%	MTH 134
	B	80.3%	19.7%	
	C	57.1%	42.9%	
MTH 128	A	75%	25.0%	MTH 141
	B	50%	50.0%	
	C	43.7%	56.3%	
MTH 141	A	86.7%	13.2%	MTH 180
	B	84.6%	15.4%	
	C	40.6%	59.4%	

Source:
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SATURN_SHRTCKG: SEQ_NO=Last, GRDE_CODE=Last
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See source for more detail. This data represents approximately 13,000 students taking MTH courses between 2006 and 2011.

The data pretty clearly shows that a student with a C in a pre-requisite course is quite unlikely to pass their subsequent course on the first attempt. This is a situation that needs to be addressed, but we are undecided as to how we will proceed. Options that have been discussed include altering pre-requisites to require an A or B, and mandating some additional structure (study groups, mandatory Mathematics Lab visits, etc.) for students receiving Cs in pre-requisite courses. We have also received data showing the success trends for ACT and Compass scores, but have not analyzed this data yet.

- How are our Dual-Enrollment students performing in subsequent courses as compared to our non-Dual-Enrollment students?

Because Dual-Enrollment sections are taught in the High School atmosphere, there has been concern that the standards might not be as high as in our more traditional, college campus based sections. We asked for data similar to that as requested for the previous question. The summary is too simple and concise to require a table:

Dual Enrollment Student Success in Subsequent Courses

Regardless of grade received in a Dual-Enrollment section of MTH 141 (Pre-Calculus) more than 95% were successful in our MTH 180 (Calculus I) class.
Regardless of grade received in a Dual-Enrollment section of MTH 180 (Calculus I) more than 92% were successful in our MTH 181 (Calculus II) class.
Source:
L:\Projects2\Acad_Dept\InstructionalProgramReview\2012_InstitutionalAssessment\Math\IA-2012-Math, Qs-13
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This data only represents 85 students, but it alleviates our concerns about the quality and reliability of Dual-Enrollment. This topic warrants no further attention at present. The department does plan, however, to continue its efforts to coordinate more effectively with the Dual-Enrollment instructors, as with all adjuncts. (See section on Departmental Activities)

Annual Cost per FTE and Trend Analyses

Provide cost per FTE and analyze for the period being evaluated.

Annual Cost per FTE and Trend Analyses

Ac. Year	**2008**	**2009**	**2010**	**2011**	**2012**	**Total**
Total Cost	$665,764.19	$670,944.77	$728,438.69	$805,837.74	$895,850.60	$3,766,835.99
FTE	381.74	380.86	469.46	486.86	478.00	2196.92
						Average
Cost/FTE	$1,744.03	$1,761.66	$1,551.65	$1,655.17	$1,874.16	**$1,714.60**

There appears to be no meaningful trend in these numbers. The increase from academic year 2011 to 2012 is very likely due to the addition of a full-time position to the department.

SWOT Analysis

Using the data collected and analyzed, complete a SWOT analysis. Reference and link data for each.

Internal Strengths	Internal Weaknesses
• Faculty members function as a cohesive department • Collaboration with adjuncts • Course coordinators for multi-section courses • Strong outreach to high school faculty via the annual Math Contest • Full-time faculty presence teaching courses online and on multiple campuses; daytime, evening, and weekend presence • Expertise and experience of faculty in courses within and across departments and divisions • Strong full-time faculty presence in Mathematics Labs at both Hillsboro and Arnold; Fall, Spring, and Summer • Expanded summer Mathematics Lab hours: daytime and evening • Online support for all students enrolled in the algebra sequence via "Ask My Instructor" link • Good technical support • Participation of department members in leadership roles in standing committees and accreditation committee; voluntary additional service on committees, as club sponsors, and community service • Professional development of faculty through local, state, national, and international conference attendance, conference presentations, and additional graduate coursework; networking with four-year institutions • Involvement as reviewers and as co-author of textbooks and supplements	• Limited computer labs for class sessions and assessment using MyMathLab • Limited computer lab hours for students, especially on weekends • Insufficient quantity of computers and inadequate furnishings at the Hillsboro Mathematics Lab (TC 209) • Limited whiteboard/chalkboard space in mathematics classrooms • HVAC issues in several buildings (too hot or too cold) • Student success and retention
External Opportunities	**External Threats**
• Improved multi-section assessment via MyMathLab • Integrating MyMathLab with dual credit program • Statewide curriculum alignment • Service learning	• Student preparedness • Reduced enrollment • Budget cuts • County broadband access limitations • Lack of easily accessible and usable institutional data specific to our program needs

Internal Strengths

The Jefferson College Math department is led by a cohesive group of highly qualified faculty who collaborate with adjunct instructions to ensure quality instructional delivery and course design. Full-time faculty participate in hiring, scheduling, evaluating, and mentoring of adjunct faculty. The Math department has a strong outreach to the high school community through participation in the annual Math contest. Both full-time and adjunct faculty members provide tutorial services for students through the math lab and professional tutoring opportunities. Full-time faculty teach online and on-campus courses at all three campus locations. Math faculty support the institution through active participation in standing committees, club sponsorship as well as community service. Faculty pursue professional growth through attending local, state, national, and international conferences; completing graduate coursework; and networking with faculty from baccalaureate institutions. In addition, several faculty members serve as co-authors and reviewers of textbooks and supplemental materials.

Internal Weaknesses

The Math department has limited access to computer labs for class sessions and online assessments using MyMathLab. The Hillsboro mathematics lab has experienced an increase number of students needing instructional support and computer access. The computer resources and furnishings in the math lab have been insufficient to serve the increased student demand. Several mathematics classrooms are insufficiently equipped with whiteboard/chalkboard space. The classrooms continue to have HVAC issues with inconsistent heating and cooling.

External Opportunities

The external opportunities for the Math department include improving multi-section assessment opportunities via MyMathLab. In addition, the faculty plan to integrate MyMathLab with the dual credit program. Faculty have opportunities to participate in statewide curriculum alignment and service learning projects.

External Threats

Student preparedness continues to be a challenge for the Math department. The lack of easily accessible and usable institutional data specific to the math program hinders the research of student success. Declining enrollments and state budget cuts impact the resources available to meet the needs of our stakeholders. County broadband limitations reduce the availability of computer access for students.

External Accreditation (if applicable)
Link to accreditation report.

Not applicable to the Mathematics Department.

INSTITUTIONAL ACTION PLANS for *Mathematics Department* / *2012*

Org	Aim	Obj	Action Plan	KPI	$	Other Req	Responsible Party	End Date	Status	Target Year	Metric Desc	Metric Value	Benchmark Desc	Benchmark Value	Target Desc	Target Value
551	II	13, 16	Provide a consolidated Academic Support Center at Hillsboro	37	TBD	Plant Funds	Arts and Science Dean		Pending (New Plan)	2014	Number of Areas	Areas	Number of areas students have to visit to get academic help	3	Number of areas students have to visit to get academic help	1

DEPARTMENTAL ACTION PLANS for *Mathematics Department* / *2012-2017*

Org	Aim	Obj	Action Plan	KPI	$	Other Req	Responsible Party	End Date	Status	Target Year	Metric Desc	Metric Value	Benchmark Desc	Benchmark Value	Target Desc	Target Value
55306	VII I	39 8	Expand and improve multi-section assessment	37			Math Department Faculty		Pilot beginning Fall 2012	Ongoing	MyMathLab Assessments	Number of sections and results	Fall 2012 results	TBD	Student Results	TBD
55306	V	30	Add computers and reconfigure Mathematics Lab with new furniture.	37	15,000	Plant Funds	Dean of Arts & Science		Pending (New Plan)	2014			Number of students using the math lab (Fall 2012-Summer 2013)	TBD	Number of students using lab (Fall 2014-Summer 2015)	20% increase
55306	II	13	Increase Mathematics Lab hours to include later afternoon, evening and possibly weekend hours.	37	9,600	Division	Division Chair Math Department Faculty		Pending (New Plan)	Ongoing	Lab hours	Number of Lab hours offered	2012-2013 lab hours data	2012-2012 Lab hours	Lab hours	10% increase in number of hours
55306	I	8 9	Increase success in subsequent courses for students receiving a C as their final grade in pre-requisite courses	Internal report			Math Department Faculty		Initial analysis/ benchmark Summer 2012	Ongoing	Internal report of success in subsequent courses (referenced and linked in this document)			TBD		TBD
55306	II	16	Investigate viable options for lease/loan of graphing calculators for students	37			Math Department Faculty		Pending (New Plan)	2013			Current lease/loan options	0	Lease/loan options	Implemen-tation of one lease/loan program

Evaluation

☒ Meets Expectations
Comments:

☐ Requires Attention and Submission of a Follow-Up Report
Comments:

☐ Does Not Meet Expectations and Requires Submission of a Follow-Up Report
Comments:

Follow-up report required by: _____
Comments: (Date)

Approvals

Linda K. Abernathy
Division Chair/Director — November 6, 2012 Date
Comments:

Shirley Davenport
Dean — November 8, 2012 Date
Comments:

M.K. Selsor
Vice President/President — January 31, 2013 Date
Comments: