INSTRUCTIONAL PROGRAMS AND AREAS
PROGRAM REVIEW/PLANNING AND EVALUATION PROCESS

QUESTIONNAIRE FOR INSTRUCTIONAL PROGRAMS

INSTRUCTIONS:

Complete all sections as instructed. Click the shaded sections to type your answer.
When completed, please save your file and e-mail it as an attachment to tanya_hanton@westvalley.edu.

A. INTRODUCTORY QUESTIONS

1. Program Name: ***Mathematics***

2. Person(s) completing the questionnaire: *Cathy VanHook and Rebecca Wong*

3. Date of completion: *Click once here and type your response*

4. What are the primary purposes of the program? Check all that apply.

- ☒ WVC Degrees and Certificates
- ☒ Transfer Courses
- ☒ WVC General Education
- ☒ Lifelong Learning/Life Enrichment
- ☐ Occupational / Vocational Courses
- ☐ Student Support Services
- ☐ Academic Support Services
- ☐ Administrative Functions

5. In one paragraph, how does the program further the College's mission and goals? (only new information need be added)

As stated in the college catalog, the mission of West Valley College is to facilitate successful learning, educate the individual, and foster the economic development of the community it serves. The Mathematics Department plays a vital role in fulfilling the mission of our college. Many programs throughout the college -- business, engineering, computer science, and more -- depend on the Mathematics Department for coursework supporting their curricular requirements involving data organization, modeling, and quantitative analysis. Also, the Mathematics Department facilitates "successful learning" by; offering lower division courses to enable students to transfer to four-year institutions; providing quality instruction to develop conceptual and computational skills; providing outside-the-class support, including the Math Resource Center, where students can get free drop-in tutoring from math faculty and/or peer tutors; and encouraging ongoing professional growth of its faculty so they are aware of the best practices in mathematics education.

6. In one paragraph, what significant events have affected or impacted the program since the last program review?

Since last year's program review:

1. *Planning for the remodeling of the Science/Math building have engaged the department in discussions about office/classroom configurations that will enhance collaboration and about the full development of an effective Math Resource Center to better foster student success*
2. *Adaptation of the ANGEL learning platform facilitating use of the web for course organization and communication*
3. *The passing of the Basic Skills Initiative giving the department the opportunity for resources and direction in improving success of students at the basic skills level*
4. *The development and implementation of additional support classes for students in Math 103, Math 106, and Math 10 through the collaboration of Math faculty and the DESP program*
5. *The adaptation of a Math Placement Test*
6. *The adoption of a new Math 10 (Statistics) textbook to meet the UCLA GAISE standards*
7. *The development of a pilot "learning community" involving Math 103 and Counseling 5 (pilot in Spring 08)*
8. *The retirement of _____ faculty members, leading to _____ of math courses being taught by associate faculty.*

B. DATA ELEMENT ANALYSIS SECTION (ANALYSIS AND RESPONSE)

1. Using the enrollment data from Table 1 from previous program review, add or revise as appropriate.

a) What significant trends are revealed in the data?
b) What factors might contribute to any program differences compared to the College data?
c) What conclusions do you draw from this analysis that could form the basis for an action, objective or request for resources?

The most recent data we have been able to access is for Spring 2005. Declines in headcount were fairly consistent with the overall trend for WVC. From Fall 2002 to Spring 2005 the college's headcount decreased by 17.6%, while the math department's count decreased by 24.1%. The program's retention and success rates are lower than the college's average. Our program accounts for 8.6% of the colleges WSCH

Our slightly higher rate may be attributed to: the level of rigor in science and math classes is higher than many other courses counted in the college's average; a decline in students preparedness for academic courses - students often arrive with an unrealistic perception of the amount and quality of work needed to succeed in math and science courses.

We need to continue to improve our delivery methods to make them more dynamic and effective. This may be accomplished by incorporating additional "smart" rooms that would allow for digital media presentations, obtaining and using Apple Mobile Learning Labs (especially in our statistics courses) to facilitate real world data collection and analysis

2. Using the demographic data from Table II from previous program review, add or revise as appropriate.

a) What significant trends are revealed in the data?
b) What factors might contribute to any program differences compared to the College data? See attachment for college-wide statistics.
c) What conclusions do you draw from this analysis that could form the basis for an action, objective or request for resources?

The demographic data shows that Mathematics enrollment is 50% men, 50% women. The overall college enrollment is approximately 40% men and 60% women.

The age-distribution for Mathematics courses differs from that of the college student body with the majority of students in Mathematics being in the younger age groups (<21 and 21-25). While these age groups represent about 60% of the student body in Mathematics, these age groups make up 84% of our enrollment. Interestingly, the college's enrollment of students over 40 years old is about four-times as high as that of the Mathematics department (approximately 20% to 5%). This higher ratio of younger students may be explained by the fact that most Mathematics classes are UC/CSU transferable. In terms of ethnic background, the distribution of students in Mathematics is very similar to that of the college as a whole.

3. Using the success data from table III from previous program, add or revise as appropriate.

a) What significant trends are revealed in the data?
b) What factors might contribute to any program differences compared to the College data?
c) What conclusions do you draw from this analysis that could form the basis for an action, objective or request for resources?

Over the years 2002 to 2005, the Mathematics department's success rate (defined as the percentage of students who received a grade of C or better, or Credit, for the course) was approximately 10% lower than the college's (55% to 65%). However, in Fall 2005 and Spring 2006, the department's success rate fell by 5% to 50%. The retention rate for Mathematics is lower than the college as a whole.

Both lower rates are partly explained by the content and rigor of the courses in the program, as well as student's lack of preparation and motivation.

The department believes we can improve both retention and success by reaffirming our commitment to the implementation of the recommendations outlined in the American Mathematical Association of Two-Year College's publications "Crossroads" and "Beyond Crossroads: Implementing Mathematics Standard in the First Two Years of College." These recommendations include:

Using a variety of teaching strategies that reflect the results of research to enhance student learning. Designing and implementing instructional activities that actively engage students in the learning of mathematics. Develop, implement, assess, and revise courses, course sequences, and programs to help students attain a higher level of quantitative literacy and achieve their academic and career goals. Faculty will use results from the ongoing assessment of student learning of mathematics to improve curriculum, materials, and teaching methods. To implement these recommendations, the department would employ various modes of delivery, such as lecture, digital media presentations, collaborative learning, and projects. To do so would require additional smart rooms and technology as noted in our latest request for equipment.

Student success would also be enhanced by further development of our Math Resource Center. Currently the Math Resource is staffed by instructors during some portion of their office hours as well as limited hours of peer tutoring. There is a need for a full-time staff person to facilitate and promote student usage of this valuable resource. The Math Resource Center also needs technology to enable students to review, practice, and extend concepts covered in their mathematics courses.

Faculty needs more opportunities to collaborate on strategies to improve student retention and success, especially at the developmental level of the mathematics curriculum. Placement test data needs to be analyzed to determine if the new placement test has had any impact on student success in these developmental courses.

4. Are there any data or factors (e.g. integration of technology; college, district, or state expectation or mandates) concerning staffing in the program, that suggest a need for increasing or decreasing program staff (e.g. permanent and associate FTE, permanent and hourly classified staffing or administrative staffing)?

The Mathematics department currently has 15 full-time and about 25 adjunct faculty that serve its needs very well. Our full-time faculty number is down 2 from our last program review. The program would benefit greatly with the addition of a permanent classified staff member to supervise the Math Resource Center. We have put in a request to hire one full-time faculty member to replace FTE lost through two retirements.

C. CURRICULUM SECTION (ANALYSIS AND RESPONSE)

1. Based on your program's curriculum information, as published in the most recent West Valley College catalog, what curriculum changes are anticipated in the next three years? (These changes could include major course revisions, curriculum deletions, new courses, revised or new options within a program, or proposed new programs.)

The mathematics program regularly updates each topic list to reflect the topics the faculty believe best represents the course. During the fall 2007 or spring 2008 semester, we will start updating all our course outlines. We are currently revising our statistics course:

1. So that it conforms to the latest American Statistical Associations Guidelines for Assessment and Instruction in Statistics Education (GAISE) standards;

2. To make it more data and technology based so it satisfies the college's information competency requirement.

2. The attached excel document shows classes that have not been offered since Spring 04. Please list the courses you intend to submit to the Curriculum Committee by February 8th for de-activation prior to publication of the 08/09 catalog.

Math 110 Preparation for ELM 1 unit

3. Considering the new course and program level Student Learning Outcomes that have been developed since the last program review:

   a) What relevant findings have been derived through the SLO assessment process since the last program review?
   b) What changes have been implemented, or are planned, based on the findings since the last program review?
   c) What conclusions do you draw from this analysis that could form the basis for an action, objective or request for resources?

NOTE: Please contact LeAnn McGinley (741-2402), Assessment Coordinator with any questions concerning SLOs.

Student Learning Outcomes have been developed to two courses, and plans have been made to develop learning outcomes for additional courses. The requirement to revise all Title V outlines will accelerate this process greatly.

When reviewing student work for the past several semesters, department discussions regarding the topics of developing students' understanding of slope and linear functions were held during department meetings. We also discussed the need to focus on more practical applications of these concepts. As a result of our discussions, we are beginning the process of developing common final exam questions for the Math 103 course, and possible others in the future.

The process of reading, scoring student work, and analyzing data each semester remains time consuming and cumbersome. Additional resources may be needed to enable us to continue this project, especially as the SLO project expands throughout the curriculum. Resources will also enable us to provide more portable "smart classrooms" (laptops with internet access and projectors) to promote the use of real-world applications and models in response to student performance on Math 103 SLOs and in other math courses as well.

D. EXTERNAL INFLUENCES SECTION (ANALYSIS AND RESPONSE)

1. If applicable, considering the effects of external influences on the program's purposes and goals:

   a) How do accreditation requirements, government regulations, advisory boards, labor market demand, transfer institution articulations or other external factors affect the program?
   b) How might these influences form the basis for an action, objective, or request for resources?

Many of our courses are UC/CSU transferable and are accepted for credit by most four-year universities. As such accreditation requirements and transfer institution articulations have an important and significant influence on the mathematics program. The faculty are kept apprised of changes or potential changes to the requirements by the college articulation officer and by talking directly to representatives of four-year institutions at conferences and by office-to-office phone calls.

UCLA is demanding that community college statistics course follow the latest American Statistical Associations Guidelines for Assessment and Instruction in Statistics Education (GAISE) standards, that is that they be more data and technology driven and less "compute by hand" driven. In order to meet this demand, the program needs to have available methods for our students to access data. The technology available in our college library is a great help to us. Having more smart classrooms available in our building (we have one now) would significantly improve our ability to present and work with real data during class sessions. We anticipate requesting resources every time the opportunity arises.

In the Spring 2007 distribution of one-time funds, the mathematics program was awarded $35,000 resulting in our purchase of an Apple Mobile Learning Lab and a Maple and Maple TA license. We had requested about $90,000 in order to purchase two Apple Mobile Learning labs, the Maple license, a Tablet PC, and data projectors. It is likely that in the next round of funding, we will be asking for at least $55,000 in order to purchase the remaining equipment (or something similar to it). In addition, we will be requesting funding to complete the conversion of AAS 17 into a "smart classroom" with the purchase of a document reader, laptop, whiteboards, and tables to facilitate student collaboration. Additional portable data projectors will also be requested to enable student to work with real data sets during class.

E. STUDENT FACTORS SECTION (ANALYSIS AND RESPONSE)

1. What program changes or initiatives has the program implemented in the last three years to meet the needs of its student population?

Several initiatives have been implemented in the last three years to meet the needs of our student population. These include:

- *The development of support classes for DESP students in Math 103, Math 106, and Math 10. In Math 103, students take an additional support class taught by DESP faculty to facilitate success in the course. The Math 106 course has been infused with an extra 0.5 unit of study skills and learning strategies curriculum taught by the math instructor during regular class meetings. Students in Math 10 can enroll in a study skills/learning strategies course that meets weekly and is taught by the Math 10 instructor.*
- *The Math Resource Center continues to provide a place for students to meet for group study and tutoring by peer tutors and math faculty.*
- *A new Math 10 text has been adopted to meet new curriculum standards in statistics, and a committee of Math 10 faculty have been meeting regularly to discuss further implementation of these standards.*
- *The Math Department has begun training on the use of the mobile Apple Learning cart to infuse more technology and practical applications in math courses.*
- *An algebra "boot camp" course was developed to boost students algebra and study skills prior to both Fall and Spring semesters.*
- *A mandatory placement test was implemented for all incoming students.*

F. SUMMARY AND CONCLUSION SECTION:

1. General conclusions and summary statement.

1. *The program's faculty are active in the institution and in their service to the local and national mathematics community. We are continually investigating ways of improving mathematics education through our development of SLO's, placement exams, common final exam questions and the algebra "boot camp." We are committed to improving students understanding of mathematical concepts through the use of technology, learning more about cognition and learning styles, and implementing the recommendations put forth in "Beyond Crossroads."*

2. We need to further develop our pedagogical skills to better meet the needs of our growing population of developmental students.

3. We need to provide continued support for our students through the further development of the Math Resource Center.

2. Program Strengths:

The strength of the Mathematics program lies in its active and innovative faculty. The faculty are actively involved in innovation both at the college and outside the college. The program's faculty:

Meet regularly to discuss its program and effective teaching techniques;

Offer a supportive learning environment in which they employ a variety of current best teaching practices and who effectively utilize available technological tools;

Attend local, state, and national mathematics conferences;

Present innovative techniques at conferences

Serve as officers in local, state, and national mathematics organzations;

Serve as graders for high school mathematics AP exams;

Write mathematics textbooks;

Serve as panel members to the National Science Foundation;

Have interned as a program director at the National Science Foundation;

Work in industry though the summer ISME program to research the mathematical needs of industry;

Several faculty members are involved as writers or graders or advisors in local, national and international mathematics competitions. One such competitons is the American Mathematical Association of Two-Year College's AMATYC exam. The exam is a two-part year-long exam. As of this writing, WVC students are placed number one in the country. Another such competition is the International Mathematics Olympiad, a competition that is held annually in July, in a different country each year. Yet another competition is the Santa Clara Valley Math Field Day, an annual competition held at San Jose State University every March. A major national student competition, the Putnam Competition, began in 1938 and is the highest level math competition for undergraduates in the United States and Canada. A WVC mathematics faculty member is a former examinee and now a current advisor to the exam.

3. Program Challenges:

1. *Increasing our retention and success rates in all our courses, but particularly in our developmental courses (Math 902, Math 902P, Math 103 and Math 106).*

2. Increasing enrollment in our pre calculus and calculus courses.

3. Increasing staffing and available hours in our Math Resource Center.

4. Analyzing the effectiveness of our new placement exam.

6. Developing SLO's for all of our courses and reviewing all Title V outlines.

7. Implementing an effective online algebra course.

8. Maintaining a full complement of mathematics faculty in the light of upcoming retirements.

9. Exploring, acquiring, and implanting more technology into our classrooms.

10. Continuing the process of revising our Math 10 course to align with the new statistics curriculum guidelines.

G. ACTIONS AND OBJECTIVES SECTION

Based on the foregoing analyses and findings in Sections A. through F., what are the program's intended actions or objectives for the next three years?

1. *We intend to find better ways to use the technology currently available to us and to expand our students' access to this technology.*

2. *The department will participate fully in the Basic Skills Initiative and use the opportunity and resources available to develop strategies for increasing success and retention in our developmental mathematics courses.*

3. *The mathematics faculty anticipate reviewing all Title V outlines and developing SLOs for all courses as part of this process.*

4. *We intend to continue our efforts to provide our students with an effective Math Resource Center that meets their tutorial needs.*

5. *To meet the college's information competency requirement, we intend to produce materials to enhance our statistics course.*

6. *The program would like to institute at least one higher level course (such as differential equations) at Lynbook High School.*

7. *The department intends to continue the process of updating its website.*

8. *The faculty intends to continue its professional development.*

9. *SLOs will be developed for Math 106.*

10. *AAS 17 will be transformed into a "smart" classroom.*

Timelines

Over the next three years, what are the program's timelines (in terms of predicted initiation and completion dates) for the stated actions or objectives?

Objectives 1, 2, 3, 4, 6, and 7 will be initiated this year and will be on-going for the next three years. Objective 5 will be accomplished during the 2008-2009 academic year. Objective 7, 9, and 10 will be accomplished during the 2007-2008 academic year (with objective 10 being dependent on funding.

Which of these actions or objectives would be initiated and completed within the coming year, given adequate resources?

Objectives 7, 9, and 10 will be completed within the coming year, given adequate resources. All other objectives would be initiated within the coming year.

H. RESOURCE REQUESTS 2006-2007

1. Please indicate if any of the resource requests identified in the previous program review were funded through one or more of the various WVMCCD resource allocation processes that were available in 06 – 07 (e.g. FTE allocation, classified staff, one time funding, budget augmentation, facilities, Land Corporation):

Please complete the following table (leave blank if the answer is not applicable):

	FUNDED by WVMCCD?
Full-time faculty FTE: *0*	☐ Yes ☐ No ☐ Partially
Associate faculty FTE: 0	☐ Yes ☐ No ☐ Partially
Classified Staff FTE: *1*	☐ Yes ☒ No ☐ Partially
Classified Hourly (in dollars): *classified hourly salary*	☐ Yes ☒ No ☐ Partially
Administrative Staff FTE: *0*	☐ Yes ☐ No ☐ Partially
Facilities (brief narrative description):	☐ Yes ☐ No ☐ Partially
Equipment (brief narrative description with estimated total cost): *1 Apple mobile learning lab $27,000, 1 table PC $2000, 5 data projectors $25,000* *Equipment needed to upgrade to address the updated statistics curriculum standards (more data driven using real world data sets)*	☐ Yes ☐ No ☒ Partially
Supplies (brief narrative description with estimated total cost): *0*	☐ Yes ☐ No ☐ Partially
Staff Development (brief narrative description): *0*	☐ Yes ☐ No ☐ Partially
Other (please specify): *0*	☐ Yes ☐ No ☐ Partially

2. What have you been able to accomplish as a result of the resource obtained?
(e.g. improved retention success and persistence, improved equity, new SLOs, higher enrollment, new online or satellite campus classes….)

NOTE: The Program Review Committee realizes that in some cases, accomplishments and changes resulting from resource acquisition are too recent to be measurable. The current Program Review process is only one year old. Future reviews of funding requests will focus on accomplishments and change occurring over a two-year period.

Statistic instructors are currently meeting to design projects using the Apple Learning Lab

I. RESOURCE REQUESTS 2007-2008

1. What **new or additional** resources are required to accomplish the stated actions and objectives?

Please complete the following table (leave blank if the answer is zero or none):

Full-time faculty FTE *1*

Associate faculty FTE

Classified Staff FTE: *1*

Classified Hourly (in dollars): *$10,000*

Administrative Staff FTE:

Facilities (brief narrative description): Complete upgrade of AAS 17 to a "smart classroom", requiring whiteboards, tables, chairs and equipment:

$12,000 (tables $111X18 and chairs $278x36)
$1500 (whiteboards $250X6)

Equipment (brief narrative description with estimated total cost): *Equipment for a multimedia classroom:*
1 Hitachi projector $1000
L Lumens document camera $1000
1 Projector Mount $125
1 DVD/VCR player $125
Audio Speakers $175
Screen $100
Overhead projector $225
Cabling, wall plates, etc. $10
Tax, shipping, handling, and electrical upgrade $150
Total: $3835

Additional Projectors to use with laptops from Apple Learning Cart:
3 X $1000
Total: $3000

Supplies (brief narrative description with estimated total cost): *Click once here and type your response*

Staff Development (brief narrative description):
Funds for training in basic skills instruction and conference attendance related to developmental education $2000

Other: *Click once here and type your response*

When completed, please save your file and e-mail (using the File: Send To menu) to tanya_hanton@westvalley.edu