

# GER 1 ASSESSMENT GUIDE

Please review the following Definition and Elaboration of Criteria for GER 1 and respond to each of the Assessment Questions (pages 2-3).

## DEFINITION AND ELABORATION OF CRITERIA

Courses offered by the College in fulfillment of GER 1 must develop computational techniques in the context of problems that are pertinent to the experience and training of the students. The Setting of these problems should be recognizable to an informed non-mathematician. The Problems themselves must require mathematical tools for their analysis. To qualify for approval, a course must satisfy the following two requirements:

- A) Include BOTH mathematics and quantitative reasoning at its core. Thus, it is expected that numerical procedures (quantitative reasoning) will be accompanied by mathematical theory as justification; and
- B) Devote a significant amount of time to applications of the mathematical methods developed in the course.

## INTERPRETATIVE GUIDELINES

1. Currently offered courses in the Mathematics Department that are most likely to satisfy GER 1 include the first course in calculus and the elementary probability course. But, in order to conform to Standard B, the Mathematics Department should ensure that its beginning courses offered for GER 1 credit will be heavily oriented toward applications. Specialized new courses in the department that are offered for GER 1 credit are expected to display practical content, not confine themselves solely to the development, however sophisticated, of a mathematical topic.
2. Mathematically oriented courses that might satisfy GER 1 are also found outside the Mathematics Department. Typically, such courses employ specialized tools and focus on discipline-specific applications, comprehensible only to those acquainted with the subject field. It is unlikely that a 3 or 4 hour course can accommodate an explanation of the peculiar quantitative needs of a discipline as well as a sound exposition of pertinent mathematical methods and still find time to provide reasonable practice in the application of those methods. It is therefore anticipated that courses offered for GER 1 credit by departments other than Mathematics, or by one of the Schools, will ordinarily have a subject matter prerequisite.

# ASSESSMENT QUESTIONS

## ANALYSIS OF COURSE PORTFOLIOS: TABLE 1

1. Based on analysis of student work and other course portfolio materials, how well are each of the GER 1 criteria being met?
  - a. What types of courses would clearly meet each criterion?
  - b. What types of courses would not meet each criterion?

## PORTFOLIO & SURVEY RESULTS: TABLES 1, 2a, & 2b, Student & Faculty Comments

2. Do survey responses of students support the portfolio analysis? If not, please explain.

## COMPARATIVE SURVEY FINDINGS: TABLES 3 – 8

Survey results are provided for all comparisons. Portfolio results are provided for instructor rank and course level because at least three portfolios were scored for each comparison group (i.e., for courses taught by tenured track faculty and non-tenure track faculty, and for lower and upper level courses.)

3. For the GER 1 course criteria, do you find any significant differences between:
  - a. Student and Faculty responses (Table 3)
  - b. Instructor rank (Tables 4a & 4b: tenure track, non-tenure track)
  - c. Course level (Tables 5a & 5b : 100-200 and 300-400)
  - d. Class size (Table 6: less than 20, 20 to 40, 41 to 75, more than 75)
  - e. Student class status (Table 7: freshman, sophomore, junior, senior)
  - f. Department (Table 8: Economics, Math, Psychology)

## GER 1: OVERALL ASSESSMENT

4. To what extent are GER 1 courses meeting the overall goals of the Mathematics and Quantitative Reasoning requirement?
5. Based on the portfolio and/or the survey analysis, do you have additional comments about GER 1 courses?
6. Did you have any difficulty interpreting the Definition and Elaboration of Criteria for GER 1? If so, please explain.
7. Is the EPC's GER designation request clear? If not, please explain.
8. Does the EPC's GER designation request address the GER 1 criteria? If not, please explain.
9. Based on GER 1 assessment results, do you have any suggestions for the EPC?
10. Were the expectations for this assessment clear? If not, please explain.

11. Was the assessment process clear? If not, please explain.
12. Did you have difficulty developing the portfolio scoring sheet and surveys? If so, please explain.
13. Did you have difficulty scoring the portfolios? If so, please explain.
14. Did you have difficulty interpreting results of the surveys (e.g., understanding tables/charts, determining appropriate standards)? If so, please explain.
15. Do you have any suggestions about the assessment process?

Please include any additional comments or recommendations you have about the GER 1 assessment results and the GER 1 assessment process.

# DESCRIPTION OF SURVEY AND PORTFOLIO METHODOLOGIES

## COURSES / SECTIONS INCLUDED IN GER ASSESSMENT

Fall 1999: 8 courses, 34 sections, 21 instructors  
Spring 2000: 7 courses, 22 sections, 17 instructors  
Totals: 8 courses, 56 sections, 25 instructors

## PORTFOLIO METHODOLOGY

Faculty members were asked to submit course portfolios for each GER 1 course they taught in Fall 1999. (Portfolios were not collected in Spring 2000.) When a faculty member was teaching multiple sections of the same course, a single portfolio was collected.

**Course portfolios collected** 15/20 (75%)

## SURVEY METHODOLOGY

All students with valid contact information who were enrolled in GER 1 courses in Fall 1999 and Spring 2000 were asked to complete questionnaires about their GER 1 courses. Students were sent a questionnaire for each GER 1 course in which they were enrolled.

**Student survey responses** Fall 1999: 803/1070 (75%)  
Spring 2000: 483/728 (66%)  
Total: 1285/1798 (72%)

Faculty members were sent parallel questionnaires for each GER 1 course they taught. They were sent a single survey to cover multiple sections of the same course.

**Faculty survey responses** 25/31 (81%)

## DEPARTMENT SUMMARY: (at least 3 courses taught by at least 3 different instructors)

		<u>Courses</u>	<u>Sections</u>
<b>Departments included in summary</b>	<b>Mathematics</b>	<b>5</b>	<b>38</b>
	<b>Psychology</b>	<b>1</b>	<b>14</b>
	<b>Economics</b>	<b>1</b>	<b>3</b>
Departments not included in summary	Sociology	1	1

## COURSE SUMMARIES (sent to departments)

### **Prepared for:**

**ECON 307: 3 sections**  
**MATH 104: 5 sections**  
**MATH 111: 17 sections**  
**MATH 112: 12 sections**  
**PSYC 301: 14 sections**

### **Not prepared for:**

**MATH 106: 2 sections**  
**MATH 108: 2 sections**  
**SOC 401: 1 section**

**TABLE 1: Course Portfolios – Mean Ratings\***  
**Distribution of Portfolio Ratings for 15 Course Sections**

Criteria	Portfolio ratings				
	Clearly rating=3	Mixed rating=2&3	Somewhat ratings=2&3	Not at all rating=1	Could not judge
1. Development of computational techniques	93% (14 sections)	7% (1 section)	0	0	0
2. Problems that require mathematical tools for their analysis	100% (15 sections)	0	0	0	0
3. Quantitative methods (numerical procedures)	100% (15 sections)	0	0	0	0
4. Mathematical theory (extent to which methods are explained & justified from a mathematical point of view)	60% (9 sections)	7% (1 section)	33% (5 sections)	0	3 portfolios with 1 rater unable to judge
5. Practical applications that would be recognizable to an informed non-mathematician	73% (11 sections)	27% (4 sections)	0	0	0

\*Means do not include scores of “could not be judged”

Description of portfolio scores (discussion of reliability):

In a calibration exercise, two portfolios were scored by all Working Group members. Differences in scores and interpretations of criteria were discussed. The remaining portfolios were scored by two Working Group members. Each portfolio was given a mean score for each of three criteria. If one scorer indicated a portfolio could not be judged for a criterion, the other score serves as the mean, and the “could not judge” score is recorded. The fourth criterion (mathematical theory) was the only one that some of the raters were unable to judge. The other rater(s) thought that mathematical theory was evidenced “somewhat” in the portfolios. Each of the criteria were evidenced at least to somewhat in student work and course material. In most of the portfolios the criteria were clearly evidenced.

**TABLE 2a: Summary of Student Responses To GER 1 Survey**

**SCALE: 1=very little, 3=somewhat, 5=very much**

**N=54 course sections**

<b>Questionnaire Item</b>	<b>Mean for all courses</b>	<b>Percent of course sections with mean of:</b>			
		<b>4 &amp; above</b>	<b>3 &amp; above</b>	<b>2 &amp; above</b>	<b>1 &amp; above</b>
1. To what extent did your course involve numerical calculations?	4.5	93%	100%	100%	100%
2. To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?	4.0	52%	100%	100%	100%
3. To what extent did your course involve applications to real-world settings, or to disciplines other than mathematics?	3.8	39%	91%	100%	100%

**TABLE 2b: Student Survey & Course Portfolio Results**

**Course Sections Surveyed: N=56; Portfolios: N=15**

Mean Course Scores for Survey & Portfolio Items						
GER 1 Criteria	SURVEY ITEMS			PORTFOLIO ITEMS		
	Scale 1-5:	1=very little 3=somewhat 5=very much		Scale: 1-3	1=not at all 2=somewhat 3=clearly	
Numerical calculations		S1=4.5		P1=3.0	P2=3.0	P3=3.0
Mathematical justifications		S2=4.0			P4=2.5	
Practical applications		S3=3.8			P5=2.8	

**Numerical calculations**

Survey Item #1: To what extent did your course involve numerical calculations?

Portfolio Item #1: Development of computational techniques

Portfolio Item #2: Problems that require mathematical tools for their analysis

Portfolio Item #3: Quantitative methods (numerical procedures)

**Mathematical justifications**

Survey Item #2: To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?

Portfolio Item #4: Mathematical theory (extent to which methods are explained and justified from a mathematical point of view)

**Practical applications**

Survey Item #3: To what extent did your course involve applications to real-world settings, or to disciplines other than mathematics?

Portfolio Item #5: Practical applications that would be recognizable to an informed non-mathematician.

**TABLE 3: Summary of Faculty & Student Responses To GER 1 Survey**

**SCALE: 1=very little, 3=somewhat, 5=very much**

<b>Questionnaire Item</b>	<b>Mean Scores</b>	
	<b>Students (N=1,283/1,798)</b>	<b>Faculty members (N=25/30)</b>
1. To what extent did your course involve numerical calculations?	<b>4.5</b>	<b>4.7</b>
2. To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?	<b>4.0</b>	<b>4.3</b>
3. To what extent did your course involve applications to real-world settings, or to disciplines other than mathematics?	<b>3.8</b>	<b>4.3</b>

**TABLE 4a: Summary of Student Survey Responses by Rank of Instructor**  
**(SCALE: 1=very little, 3=somewhat, 5=very much)**

Questionnaire Item	Mean Scores	
	Tenured/eligible (N=620/876)	Non-tenure eligible (N=662/921)
1. To what extent did your course involve numerical calculations?	4.4	4.6
2. To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?	3.9	4.0
3. To what extent did your course involve applications to real-world settings, or to disciplines other than mathematics?	3.8	3.7

**TABLE 4b: Summary of Portfolio Scores by Rank of Instructor**  
**SCALE: 1=not at all, 2=somewhat, 3=clearly**

Portfolio Item	Mean Ratings	
	Courses taught by tenured/eligible instructors (N=8)	Courses taught by instructors not eligible for tenure (N=7)
1. Development of computational techniques	3.0	3.0
2. Problems that require mathematical tools for their analysis	3.0	3.0
3. Quantitative methods (numerical procedures)	3.0	3.0
4. Mathematical theory (extent to which methods are explained & justified from a mathematical point of view)	2.5	2.8
5. Practical applications that would be recognizable to an informed non-mathematician	2.9	2.8

<b>TABLE 5a: Summary of Student Survey Responses by Course Level</b> (SCALE: 1=very little, 3=somewhat, 5=very much)		
<b>Questionnaire Item</b>	<b>Mean Scores</b>	
	<b>Lower (100-200)</b> (N=1,033/1,415)	<b>Upper (300-400)</b> (N=250/383)
1. To what extent did your course involve numerical calculations?	<b>4.5</b>	<b>4.5</b>
2. To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?	<b>4.0</b>	<b>4.0</b>
3. To what extent did your course involve applications to real-world settings, or to disciplines other than mathematics?	<b>3.6</b>	<b>4.3</b>

<b>TABLE 5a: Summary of Portfolio Scores by Course Level</b> SCALE: 1=not at all, 2=somewhat, 3=clearly		
<b>Portfolio Item</b>	<b>Mean Ratings*</b>	
	<b>Lower (100-200)</b> (N=11)	<b>Upper (300-400)</b> (N=4)
1. Development of computational techniques	<b>3.0</b>	<b>3.0</b>
2. Problems that require mathematical tools for their analysis	<b>3.0</b>	<b>3.0</b>
3. Quantitative methods (numerical procedures)	<b>3.0</b>	<b>3.0</b>
4. Mathematical theory (extent to which methods are explained & justified from a mathematical point of view)	<b>2.9</b>	<b>2.0</b>
5. Practical applications that would be recognizable to an informed non-mathematician	<b>2.9</b>	<b>2.9</b>

\*Mean ratings are calculated using mean scores of each portfolio included in comparison group

**TABLE 6: Summary of Student Survey Responses by Class Size**  
(SCALE: 1=very little, 3=somewhat, 5=very much)

Questionnaire Item	Mean Scores			
	<20 (94/141)	20-40 (893/1,185)	41-75 (187/307)	>75 (108/164)
1. To what extent did your course involve numerical calculations?	4.5	4.5	4.4	4.5
2. To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?	4.0	4.0	4.1	3.3
3. To what extent did your course involve applications to real-world settings, or to disciplines other than mathematics?	4.5	3.6	4.4	3.6

**TABLE 7: Summary of Student Responses by Class Status**  
(SCALE: 1=very little, 3=somewhat, 5=very much)

Questionnaire Item	Mean Scores			
	Freshman (748/915)	Sophomore (323/471)	Junior (131/223)	Senior (76/170)
1. To what extent did your course involve numerical calculations?	4.5	4.5	4.6	4.6
2. To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?	4.0	4.0	3.8	4.0
3. To what extent did your course involve applications to real-world settings, or to disciplines other than mathematics?	3.6	3.9	4.0	4.2

**TABLE 8: Summary of Student Survey Responses by Department**  
**(SCALE: 1=very little, 3=somewhat, 5=very much)**

<b>Questionnaire Item</b>	<b>Mean Scores</b>		
	<b>Economics (64/100)</b>	<b>Mathematics (1,033/1,415)</b>	<b>Psychology (171/247)</b>
1. To what extent did your course involve numerical calculations?	<b>4.4</b>	<b>4.5</b>	<b>4.6</b>
2. To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?	<b>3.8</b>	<b>4.0</b>	<b>4.0</b>
3. To what extent did your course involve applications to real-world settings, or to disciplines other than mathematics?	<b>3.9</b>	<b>3.6</b>	<b>4.4</b>

## RELEVANT SPRING 2000 STUDENT & FACULTY COMMENTS

**Prompt: "Comments about the GER 1 course requirement or this survey"**

**(Comments are not edited for grammar)**

### **MATH 104**

this is the only math course I've ever found interesting, and although I'm not going to be an engineer or even a math major, I certainly appreciated the course (which I wouldn't have considered taking if it wasn't a ger)

I don't think you should require English majors to take math classes. However, I actually enjoyed this particular math class because the teacher, Professor xxx, was excellent.

GER 1 is difficult for many students who are not math-inclined, however Math 104 did an excellent job of teaching math in a unique & helpful way.

I think BETTER explanation needs to be given for why we have to have GER 1.

I think GER 1 is a valid requirement for a liberal arts education and I think Math of Powered Flight is the perfect type of class to have as an option for non-math oriented students because it incorporates mathematics in a interesting real world situation.

The course was fine. But the whole GER system needs to be destroyed as soon as possible. I came here to learn, not meet requirements to earn a degree. As a matter of fact, I am leaving this college after this semester, because I have felt that there is nothing more to be learned here. I do not want a degree to help me earn money, I wanted an education. As a University, I know you are no different than most, so I guess my statements are general. I am disappointed to realize that college is a drain of resources and time, and that there is no true value in my continuing to gain an "education" at this establishment. May you live long, and continue to give degrees to people who do not deserve them, and drive those who want to learn out into the real world, where they might actually learn something about life. Thank you for your time.

Math of Powered Flight is the first time I've really started to get confident with math -- usually it scares me to death, but this made sense.

I have to say that math is not my favorite subject at all, but I loved this class, and Professor xxx is awesome. [The professor] makes math fun and understandable, and is totally there for [the] students.

i liked professor xxx a lot. [the professor] is a good teacher for non math minded students.

Terrific course, neat real world applications. .... excellent professor. .... highly recommend course for anyone even interested in aerodynamics or airplanes. Very well Done.

This was a good course for those who have a low confidence level in Math. ... I would recommend it to others who are looking to fulfill the math requirement but who may have had trouble in previous math classes

This was a very interesting class taught by XXX and I would recommend it to anyone who does not need a high level math course for their major. ... This was a very interesting course--not your typical math course. The subject (airplanes and flight) was more applicable to the real world

Math 104 was definitely math-intensive, but it was more of a physics course

... [My prof] was very helpful and explained calculations clearly.

I thought the course was set up wonderfully and Professor XXX did a great job of presenting the material clearly

It is an interesting, easy GER 1 credit.

## **MATH 106, MATH 108**

I dislike W & M's GER 1 requirement in general and felt that this class was a waste of my time. I totally disagree with having a GER 1. I really hope that the school will strongly consider getting rid of it for next year!

The GER 1 course requirement had little to do with my concentration, as far as any practical applications are concerned. A suggestion would be that students who are not majoring in a science-related field should be exempt from GER 1, provided that they have taken an AP math course with a score of at least 3 on the exam.

The reason for performing the calculations and formulas that we did was unclear or not presented, making it difficult for those not mathematically inclined to understand when and why they should be used. Since this is a beginning course and a GER, it should be taken into greater account the number of non-math majors in the course.

... I thought this course was very helpful in helping me to better understand statistics I come across everyday. Professor XXX did very well explaining course material and seemed quite knowledgeable in this area. [The professor] always seemed quite prepared for class with plenty of examples and explanations.

I think you got what you put into this class. It was easy to understand the material if you had some sort of previous understanding of the math. A lot of people skipped a bunch of classes, because the class material was over their heads.

It is a very interesting and informative class. I would suggest it to anyone not planning to concentrate in mathematics, but wishing to fulfill the GER 1.

The teacher... doesn't explain where the formula or idea is coming from. [The teacher] just shows us how to justify the formula by rearranging it into a solvable equation, but what [the equation] equals I have no idea?

I found this course to be very informative, especially when it related material to other courses such as economics as well as the real world.

I thought that this was a very good math class that did involve some interesting real-world settings, which really made it much more interesting.

## **MATH 111**

A math requirement is good, however a practical math option would be nicer.

Calculus 111 is a good course to take for the GER 1 requirement.

I feel that this course should adequately meet these requirements. I feel that the failure of my particular course to meet these requirements was due to the inability of my professor.

I never liked math before this class, keep it as a GER and keep teaching the same material at the same pace, I actually understood a math class, that's quite an accomplishment!

I think that Pre-Calculus should also be evaluated and considered as a GER 1

My calculus 111 class fulfilled every aspect of a GER 1 course

I am enrolled in Professor XXX's Calculus 111 class, and although I have not been a fan of math in the past, I have a new appreciation of math now because of [the professor's] method of teaching. [The professor] focuses on teaching students concepts rather than simple formulas and I believed that has helped to train my mind.

I am very dissatisfied with the book we are using. I like how the book is set up, but there are not enough examples and the book makes topics more complicated than they really are.

I enjoyed it and it sparked an interest in calculus enough for me to enroll in 112 for the fall semester...it moved a little slow though

I had actually rediscovered a deeper appreciation for Calculus, since I had a horrible time of it in high school. ... This was an informative course, review of old material for those that had

- taken Calculus before and introduction of certain new concepts, and the accumulation of old and new concepts.
- ... I think that the classes need to be more standardized. My course involves physics problems but i don't think that that can really be considered real world settings unless you are a physics major. The hint book that goes along with the homework problems or i guess the textbook in general gives the hardest solutions it can find. It does everything in a round about way when there is a much easier way to solve the problem even without using unnecessary shortcuts.
- I realize that this is a basic calculus course and that for those people on campus that have little calculus background it is kept simple. This though comes to be a problem for me. After having a year of pre-calc and a year of honors calculus I thought taking calculus 111 would help me to further understand the methods and ideas that I learned in high school.. However, I came to realize it is just a repetitive course. And math 112 is to hard to skip straight into to challenge. so we are left with a math course that is too easy to help advanced students and a little to hard to help those who aren't advanced leaving some of us bored while leaving the others confused.. Try and get more covered in calc 111 as opposed to going in depth into certain areas. Getting to only integrals the last week of a calculus course is really not allowing students to learn it is forcing them to learn basics that later on in the course they learn the shortcuts to anyway..Treat the basics ass a need to know idea but then move on and show kids how to do it quicker and correctly. I mean seriously how many math tests do you know of.tat are left with no time limit.. allow the students to learn to their fullest so put more in it and keep it more superficial.
- I took AB Calc. in high school and scored a 3 on the AP exam, which didn't give me any calculus credit. The math 111 Calc class was slower than my high school calculus class. I feel by having to sit a semester through this course only hurt me because slower speed made me uninterested in calculus, where I used to love it. I think students that score at least a 3 should be able to get credit for math 111.
- it was easier than the ap course i took in high school. i wish my 3 on the ap test counted for credit.
- I think that the course that I took centered too heavily on proving concepts. The professor would try to teach through the proofs rather than using the proofs to support what [the professor] was teaching.
- I thought the course was very good. I took calculus last year and didn't really understand a lot of it. This year, my professor made everything very clear, and i feel as though i have a good grasp on calculus.
- I took Calculus in high school, but was unable to get out of it here due to a low AP score. I think this was a good thing, however, because I was reintroduced to concepts that I believe will be helpful for a business major, which I am looking into at the moment.
- It was a very useful course because it focused more on the why certain formulas worked as opposed to just presenting the formulas for memorization.
- more explanations of course beforehand
- Not a bad class. The only change I would make is to spend more time on things that seem to be key in calculus. We didn't cover antiderivation or integrals until the last couple of classes and when I took calculus before, those seemed to be key concepts.
- The course requirement is adequate and shouldn't be increased.
- this course was interesting in that our professor used lots of proofs to show us where the calculus theorems come from, but often [the professor] did not use specific examples or real world problems.
- To be truthful, math11 was like elementary math for me! i am an international student, ..., and with my background in math this class was just wasting time for me. maybe you should teach more challenging stuff in math 111!!!

## MATH 112

Class fills the Ger really well- anyone who takes it is more than well qualified to encounter mathematics in the real world

Definitely a good course to fulfil GER 1 -- tons of math (duh), and very applicable to a variety of other disciplines--chemistry, physics, cscic etc.

For heaven's sake, it's CALCULUS, how could it NOT fulfil the math GER?

I already fulfilled GER1, yet I believe that this was a more applicable class to the real world than Math111 was

I am a big fan of GER 1; students are too eager to drop math when they can but I think there are tremendous benefits to critical thinking through numbers.

I felt that the numerical calculations/actual mathematic part of calculus was the most important part. Applications to other courses such as physics, biology, etc. were not interesting and would have been better taught in a physics or biology course. When taking a class like math, it is stupid to just look for the value of applications and I felt that that was what the GER requirement was driving at.

I hated the practical applications to the real-world settings, such as Physics. ... I learned a great deal of useful math from this course. Many times the course seemed to parallel the work I was doing in Physics 102.

I personally think GER1 should be emphasized more.

I think the math requirement is very important. ...this course fulfills the requirement well difficult course, wish there was more time to let the material sink in - too much material for one semester

I feel that i am not prepared for the departmental final exam. I dont like the idea of the departmental final because of a situation like this. There are plenty of topics not even discussed in my class that other students have been thoroughly taught. In addition, the text book is horrible. It doesnt explain what it is doing and it complicates things more than they should be. However, I do like the organization of the book in the chapters.

i don't understand the function of the labs at all !!!!

... Almost all of the course was way over my head in the amount of explanation I received on how to derive the rules for doing the problems. I hope that in future math courses I take, I'll be able to understand why I do the stuff I do. ...

It was really hard, I think that it is unfair to give all sections of MATH 112 the same final, and grade without a curve.

my professor spent too much time on deriving equations and not enough time in showing examples, so i don't feel like i learned everything the course was supposed to teach us.

... I felt that the labs were unnecessary. In Calc111, I found them to be helpful, but in 112, I honestly found them to just be extra work.

Nice basic calculus class. Nothing special or unusual.

not enough real world applications

LABS are confusingly worded. Sometimes they enhance conceptual understanding, and other times they only tear down something I previously understood.

The course was mostly pure mathematics; when applications were involved, they were difficult and not particularly well explained. The result was that the course seemed to be pure math merely for the sake of doing math, when it perhaps should have been a little more balanced between the two aspects.

The Math 112 curriculum and teaching need to be revised, I have one proffesor and a friend of mine is enrolled in another proffesors class and there is a great diffrence in difficulty in between the two. If a department final is going to be used for all Math 112 classes each class should cover the same material with the same level of difficulty, preparing all students for the exam equally.

this is a a very hard class that should only be taken by math majors, otherwise you will never use it

Thought learning skills such as computing integrals and finding limits is important in the field of mathematics it is much more meaningful when the connection to the real world is CONSTANTLY shown. The connection was showed sometimes, but in many cases, I felt that had I a better grasp of the real world connections, the more interesting and easy to udnerstand calculus would be.

### **PSYC 301**

I think that this Statistics course really was a great way for me to fulfill this GER. I am not great in Math but this subject was challenging and was based on real-world settings which made it great. ...

I didn't enjoy spending hours working problems out by hand, which are done nowadays on computers in the real world.

I hate math so I was not thrilled to have to take this course, but I need it for my major as well, so it was pretty much unavoidable.... my TA was very helpful and took a lot of time to explain the mathematical calculations as well as the theories behind them. In relation to psychology on a whole, I did not see a use in having to know how to do the calculations by hand. The analogy I've used before is why memorize the phone book when it will always be there to use? In the same way, why learn hand calculations when I can use SPSS and other stat. programs? I understand the whole knowledge thing, and how it is valuable to learn even if only to expand one's mind and for no other reason, but I don't see the use in this particular situation.

I liked the set-up of this course with the lab and the classroom. The lab explained the math that we did in class very well.

I was pleased with the course and the professor although it seemed as if most of the material wasn't very practical.

I thought the class was very practical and had more real implications than Calculus did.

....I felt that I was learning the material simply to pass the test, not for use later in life.

The course is useful, however I think we could have covered more material over the semester than we actually got to.

This class is good for people who aren't very good at higher level math.

This course was practical ...

tons of math- tons of application to the real world, specifically psychology-

Uses basic math that is not too hard for the average college student, although the computations may take hours while doing homework

### **ECON 307**

As opposed to many mathematics classes that I feel might not be useful to most liberal arts majors, Statistics is practical and applicable. I think W&M should do a better job of publishing this as a GER1 alternative to MATH111 or 112

i felt like i just needed to know equations without knowing exactly how they were used and what the answers meant.

very applicable but the material is so confusing and moves so quickly it is hard to comprehend and when assignments are behind the material they are pointless and detrimental to the new material

## **FACULTY COMMENTS**

A wide range of real-world applications are considered from many fields. Since the students are not assumed to have any specialized background, only applications which can be understood with general knowledge can be used. In statistics and probability this is not terribly difficult.

I am a visiting/adjunct faculty member and had no idea what "GER 1" meant for the last few weeks (and I have been teaching here for almost 4 years). Even though "GER 1" must mean something to all full-time faculty, if you want participation in the survey by part-time/adjunct/visiting faculty as well, you may want to indicate what GER means somewhere in these emails, memos, and surveys. Thank you.

I'm not sure what question #2 means. What does it mean? (*To what extent did your course involve mathematical justifications explaining why the approaches and calculations used in your course actually work?*)

The emphasis of Reformed Calculus, of which this course is a part, is to treat every topic in four ways whenever possible. The four ways are numeric, geometric, algebraic, and descriptive. I try to do this even when my students ask for the "way" to work the problem rather than so many choices. They no longer ask if Calculus is useful in the real world. Each semester, some students who have had the subject in high school will tune out the explanations of WHY things work. Mathematics examples are easier to create to show the wanted properties, but I try to select examples from Biology, Economics, Physics, and other fields when I can. One of my students this semester complained that I was ruining his attitude at work by using problems on maximizing profits. He got little return from cleaning his area very well at the end of the day in the restaurant--no tips for that.

There are a lot of material in this course. If a student can master the material well, he/she certainly fulfills a general math training requirement.

About this survey and Math 111: Since there are many sections of Math 111, and different instructors have different emphasis, it is not surprising to see very different answers for this survey.

## **STUDENT COMMENTS SPECIFIC TO SURVEY**

The survey's questions are somewhat limited in finding out what a student gets out of the course.

I strongly feel that although this survey is brief, it should be given a week or 2 before finals -- not during finals week!

This survey is a great idea, I think it would be neat to do the professor evals electronically if they could be anonymous

Don't take survey during finals!