

Teaching Dossier

Manuela Girotti

Teaching experience at Concordia University (2010–2014)

As a consequence of the scholarships “Exemption MEQ” and “Concordia Merit award” (see résumé), some teaching duties were waived during my Ph.D.

Courses

- **MATH 205 – Differential and Integral Calculus II:** For two consecutive semesters (Winter and Fall 2011) I was appointed as instructor for one of the sections of the (coordinated) course MATH 205. MATH 205 is an introductory course to integrals and series; the focus is set on applications, rather than on the theoretical aspect. I was responsible for the preparation of the mid-term exam, while the final was common throughout the sections.

Due to the tight schedule and the big quantity of material that needed to be covered, there was not enough time for engaging the students in discussion and exercises in class, but I was still trying to make the students involved in active participation to classes by asking them stimulating questions and asking their suggestions about ways to solve examples in class.

As a side remark, despite the fact that the topics of power series and Taylor series were placed at the very end of the course syllabus, I do believe that they are important Mathematical tools that a student in a Calculus course should acquire. Therefore, I still tried to allocate a reasonable amount of class hours to clearly explain the material and solve exercises in class.

- **MATH 201 – Elementary Functions.** During the Fall semester 2013 I conducted exercise sessions (1 hour per week for 13 weeks in total) for the (coordinated) course MATH 201. MATH 201 is a course covering basic mathematical notions (composition of functions, inverse function, polynomials of second order, exponential and logarithmic function) and trigonometry.

In delivering exercise tutorials, I was carefully selecting examples that would highlight the mathematical theory behind and the different situations where the formulæ could be applied. At the beginning of class I would recall the main tools that were taught by the instructor during the week and that would have been used in the exercise session. This way the students could follow more easily the solving process.

Technical assistance

For two academic years (2012–2014) I have been responsible for the management of the online system WeBWorK for the assignments of the service courses MATH 200, 201, 202, 203, 204 and 205.

There were (approximately) bi-weekly meetings with the Undergraduate Program Director and the course coordinators, during which we were discussing a various range of topics about how to improve the learning curve of the students and implement it in the WeBWorK system.

Part of my duties was also to fix possible bugs in the systems and in the exercises (sometimes using the programming language Perl), set up the assignment load for all the courses at the beginning of each term and downloading grades to send to the instructor at the end of each term.

Teaching experience at Université catholique de Louvain (2014–2016)

The post-doc position at UC Louvain was funded through a European research grant (CRaMIS ERC grant) and a teaching activity was not allowed in my contract.

Mentoring and tutoring

Despite the aforementioned limitation, I was involved in mentoring activities: I posted a thesis (“mémoire de maîtrise”) proposal on Soliton theory and Integrable Systems for the master students in Mathematics, I gave my availability for mentoring undergraduate students for their final project and I gave private tutorial lessons in Probability and Statistics.

Teaching experience at Colorado State University (2017–2018)

The postdoc contract at Colorado State University included a teaching load of two courses per academic year (one per semester).

Courses

- **MATH 369 – Linear Algebra:** in the Spring semester 2017, I was the instructor of the non-coordinated course MATH 369. MATH 369 is a proof-based introduction on the basic notions of Linear Algebra: linear systems, matrices, vector spaces, linear transformations, eigenvalues and eigenvectors.

Along the semester, students were asked to submit homeworks, pass one midterm test and a final exam, all prepared by myself. In order for them to better learn both the Linear Algebra theory and a general mathematical thinking and writing, I was posting detailed solutions of all the homeworks and the midterm, so that, by comparing their production with what was expected to be submitted, students could better understand what was incorrect or incomplete in their papers. This strategy turned out in a great payoff at the end of the semester, when students were capable of writing clear and structured proof in their finals.

I also introduced the practise of giving small quizzes (timed testing) along the semester that the students were asked to solve in class and that I would later grade. Quizzes were a useful tool for giving me an overall understanding of how much the class was following my lectures, but on the other hand they were discouraging students, because the limited time that was allowed (15 minutes) was putting too much pressure on them. Therefore, I decided to abandon this project for the courses in the following semesters.

- **MATH 317 – Advanced Calculus for one variable:** in the Fall semester 2017, I was the instructor of one section of the coordinated course MATH 317. MATH 317 is an advanced course mostly aimed at senior students majoring in Mathematics; the goals of the course are to review the main results of Calculus I and II with a deeper and more theoretical perspective: sequences, limits, continuity, derivatives and integrals, series.

The homeworks, two midterm tests and final exam were mostly created jointly with the professor in charge. I set up additional exercise sessions outside the class schedule whenever a midterm test or the final exam were approaching. The students highly benefitted from that and they actively participated in the meetings.

Since the textbook wasn't putting too much emphasis on some important analytical theories, like power series, I complemented the learning material with my own set of notes which were distributed to the students and posted on Canvas as well as on my website. Some students (mostly students who wanted to continue their academic career in graduate school) gave me positive feedback on this practise.

- **Lecture course on Determinantal Point Processes and Random Matrices (MATH 676 – Topics in Mathematics):** during the Fall Semester 2017, I conducted classes on Random Matrix Theory and Point Processes, basing most of my lectures on research and survey papers.

The class was meeting once a week and the format was similar to an informal working group, where attendees (graduate students, postdocs and some professors) were welcome to ask questions and start active discussions during the lectures.

- **MATH 345 – Differential Equations:** in the Spring semester 2018, I was the instructor of the Honors course MATH 345 (non-coordinated). MATH 345 is an intense course on introduction to Ordinary Differential Equations: it covers first and second order equations (techniques of integration), first order systems of equations, numerical methods, qualitative analysis.

The course testing consisted on two midterms, a set of homeworks and a final exams. Students were again provided with detailed solutions to the homeworks. For the lab sessions, I wrote complementary notes and exercises about numerical integration and the use of MATLAB for the study differential equations that were distributed to the students.

Instead of using the quiz practise as in MATH 369, I decided to dedicate one class per week to have an exercise session. This class was not a frontal lecture, but it was a flipped class: students were given a sheet with exercises (based on the theory explained in the previous days of class and recalled at the beginning of the exercise session) and they were first given a few minutes to think about the problem individually and independently and then asked to try to solve it by actively discussing together about its resolution. One volunteer student would then come to the board and write down the solution with the help of the other students in class. Given the small size of the class (about 12 students), there was no need to divide students into small work groups. Both these exercise sessions and the extra sessions in preparation for the tests were greatly appreciated by students.

- **MATH 530 – Mathematics for Scientists and Engineers:** in the current Fall semester 2018, I am the instructor of the graduate course MATH 530. It is a course aimed at graduate students from Departments other than the Mathematics Department, who are enrolled in

the Mathematics Graduate Interdisciplinary Studies Program at Colorado State University. The goal of the course is to teach the students a working knowledge of the fundamental mathematical tools in linear algebra, ordinary differential equations and partial differential equations.

Being a graduate course, the lectures are fast-paced and all the student work is evaluated via weekly homeworks and a final take-home project. The aim is to accustom students to an academic research environment where they are given time to think about the problem (but still with a submission deadline). In this way, they can be able to explore different solving possibilities and research tools (with the use of the textbook and programming softwares) that could be useful to them for tackling the exercises or learning new techniques based on the theory seen in class.

Student supervision

In the Spring semester 2018, I supervised one of my students from the course MATH 345. MATH 345 allows students to conduct an honors project and gain an extra credit in their transcripts.

I gave the student a guided project where he had to analyze the Van Der Pol equation using the techniques seen in class (equilibrium points, phase space) and exploring some slightly more advanced techniques (perturbation methods and Levinson-Smith theorem for the existence of limit cycles). Since the student was majoring in Computer Science and Computational Mathematics, I also tailored the project to his main domain of specialization by adding a part of the project focused on numerical analysis and stability of numerical methods (stiffness).

We had regular meetings along the semester during which the student was reporting on his progresses and I would answer and clarify some doubts, if any. The student performed very well and greatly enjoyed facing and solving the challenges that this project was posing.

A (non-random) selection of students's comments

- Very well taught. Office hours were helpful when I could attend. [...] One of the best Math professors I've had. (MATH369)
- Manuela is a great teacher and is willing to help her students. The content of this class was very challenging but she was able to help me understand during office hours. (MATH369)
- This class is hard! [...] Lectures are educational though, instructor is good and answering questions. Homework is exceptionally challenging and graded harshly, but also educational and rewarding. (MATH369)
- Thanks for challenging us and making the course interesting! (MATH369)
- I enjoyed this class. The only thing I wish I got more from this class is understand the real world applications or why this is useful. But you're an awesome teacher! Thank you (MATH369)
- Thanks for pushing me to become a better mathematician. I can walk away from this class with a solid, basic understanding of Analysis. (MATH317)
- Thanks for improving and showing you care to be here. Thanks for a good semester! (MATH345)
- Dr. Girotti is one of the smartest, coolest professor I've ever had! She really cares that you understand what you are doing with differential equations (as long as you show that you are making the effort). (MATH345)
- Dr. Girotti was extremely helpful outside of class and was thoroughly enjoyable to have as a professor. Dr. Girotti, thank you for a challenging semester! I learned a lot of interesting and crazy things. (MATH345)
- You're a fantastic teacher and despite this being a difficult course you made the material approachable. I appreciate the balance of theory and practise and I definitely felt like I learned much more than I expected. (MATH345)

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Concordia University Course Evaluation Report

CUPFA

PROF: MANUELA
GIROTTI

DEPT: MATHEMATICS AND
STATISTICS

COURSE: MATH
205

SECTION: C **YEAR:** 2010 **TERM:** 4W

NUMBER OF EVALUATIONS: 1

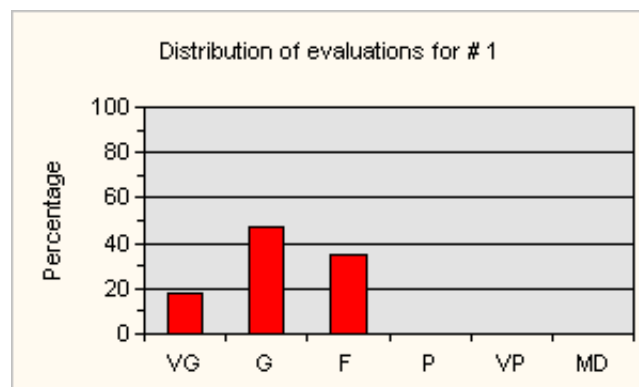
NUMBER OF STUDENTS: 50

STUDENTS RESPONDING: 17

PERCENTAGE OF STUDENTS RESPONDING: 34%

1. Overall, this course has been...

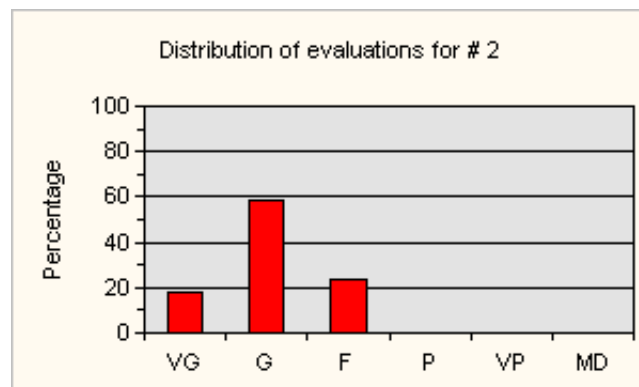
Median:	2					
Assessment:	Above average					
Student	VG	G	F	P	VP	MD
Responses:	3	8	6	0	0	0



VG=Very Good, G=Good, F=Fair, P=Poor, VP=Very Poor, MD=Missing Data

2. Overall, the instructor has been...

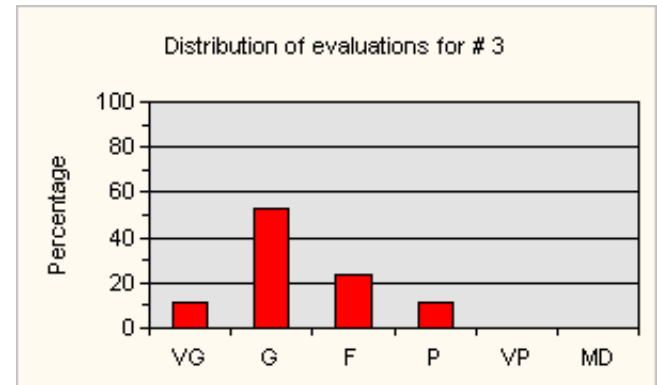
Median:	2					
Assessment:	Above average					
Student	VG	G	F	P	VP	MD
Responses:	3	10	4	0	0	0



VG=Very Good, G=Good, F=Fair, P=Poor, VP=Very Poor, MD=Missing Data

3. Overall, my learning has been...

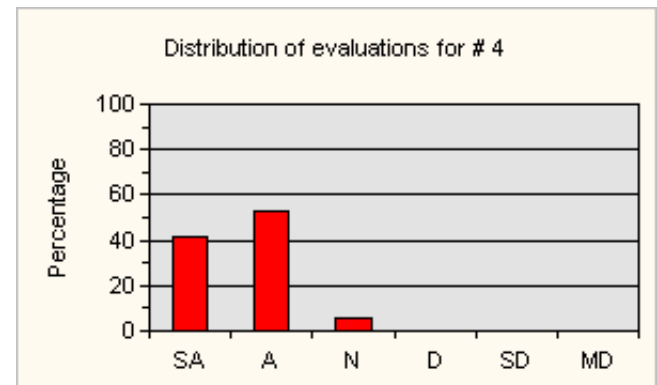
Median:	2					
Assessment:	Above average					
Student	VG	G	F	P	VP	MD
Responses:	2	9	4	2	0	0



VG=Very Good, G=Good, F=Fair, P=Poor, VP=Very Poor, MD=Missing Data

4. Course outline and syllabus are clear, complete and well explained.

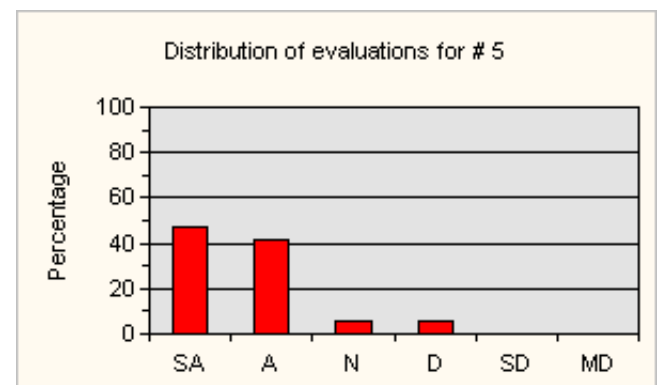
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	7	9	1	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

5. Course materials, text book or readings are useful or relevant.

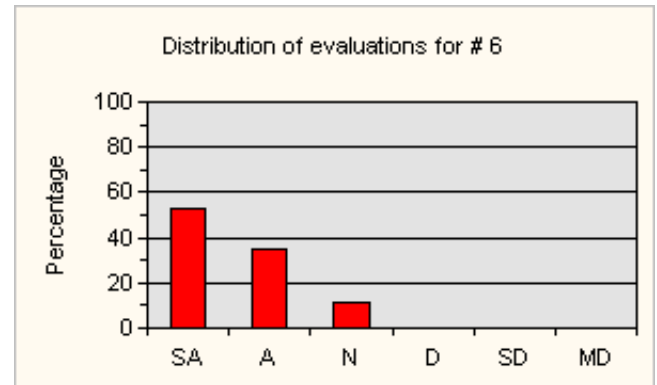
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	8	7	1	1	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

6. I have found this course intellectually challenging and stimulating.

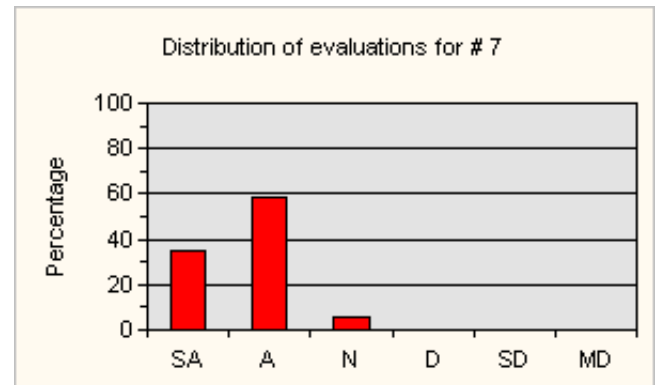
Median:	1					
Assessment:	Well above average					
Student	SA	A	N	D	SD	MD
Responses:	9	6	2	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

7. The course met the objectives as stated in the course outline.

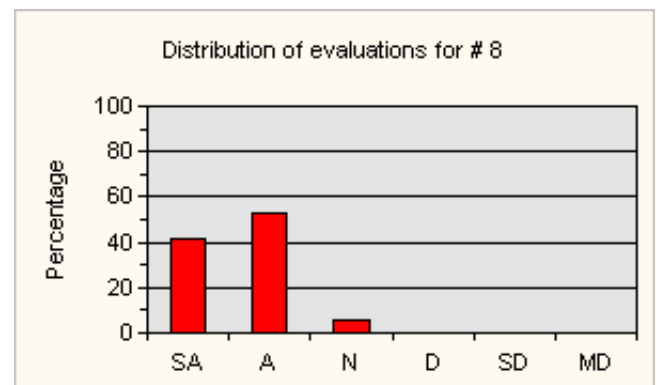
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	6	10	1	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

8. Instructor demonstrates a comprehensive knowledge of the subject matter.

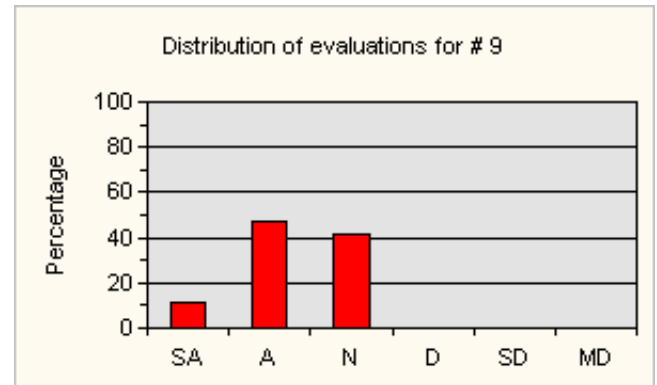
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	7	9	1	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

9. The instructor's explanations are clear.

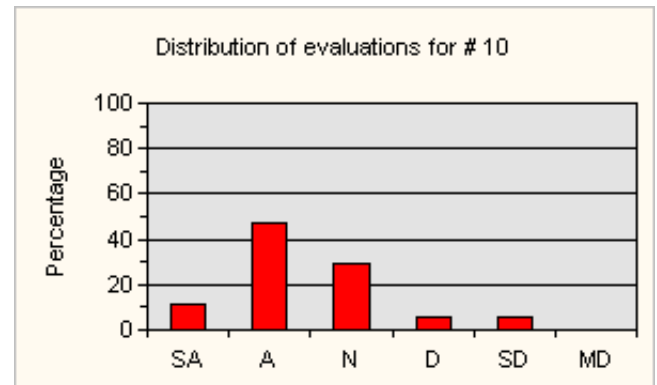
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	2	8	7	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

10. The instructor provides feedback in the form of exams and/or assignment grading.

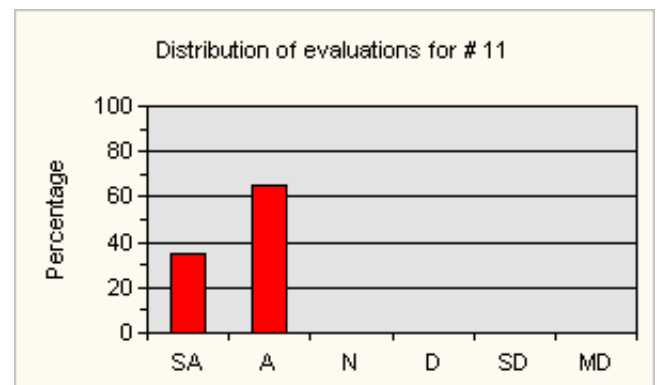
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	2	8	5	1	1	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

11. Students are encouraged to ask questions.

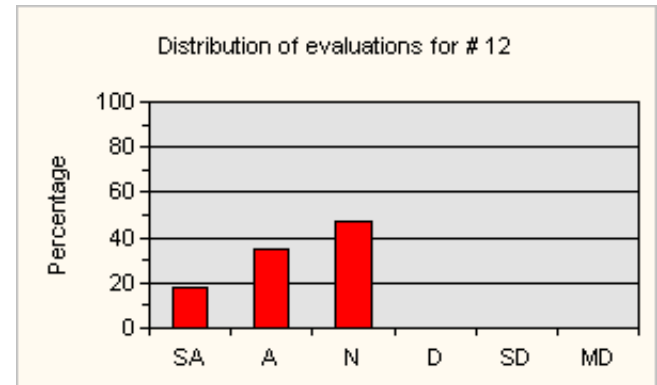
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	6	11	0	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

12. Students are encouraged to share their ideas and knowledge.

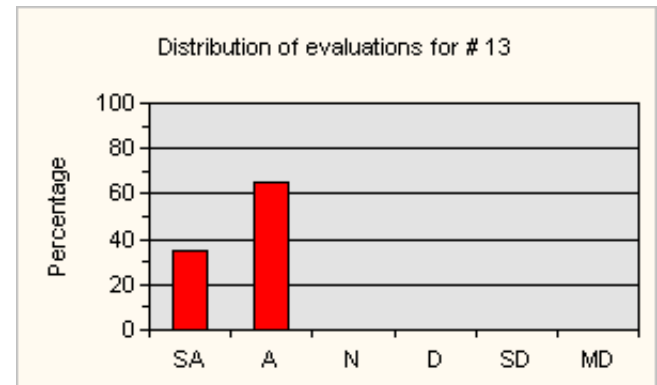
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	3	6	8	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

13. The instructor is approachable.

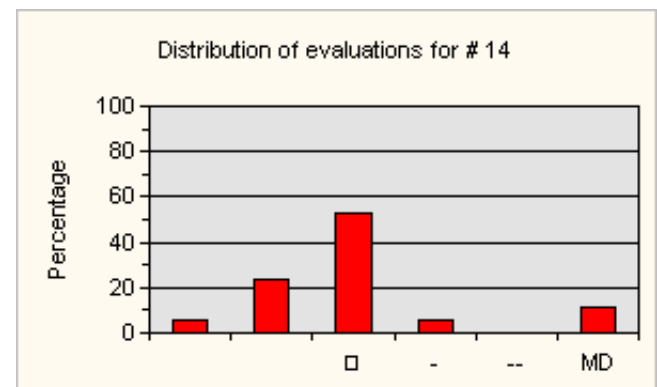
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	6	11	0	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

14. Overall, my involvement in this course has been...

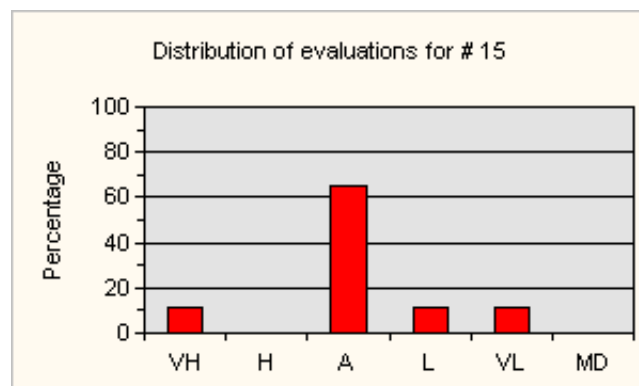
Median:	3					
Assessment:	Average					
Student	++	+	±	-	--	MD
Responses:	1	4	9	1	0	2



++=Well-Above Average, +=Above Average, ±=Average, -=Below Average, --=Well-Below Average, MD=Missing Data

15. What was your level of knowledge of the subject prior to taking this course?

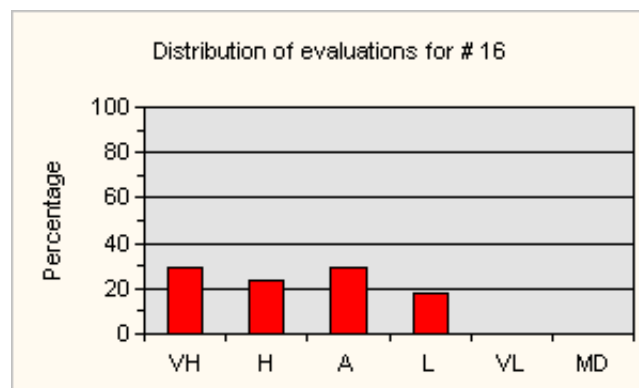
Median:	3					
Assessment:	Average					
Student	VH	H	A	L	VL	MD
Responses:	2	0	11	2	2	0



VH=Very High, H=High, A=Average, L=Low, VL=Very Low, MD=Missing Data

16. What was your level of interest in the subject prior to taking this course?

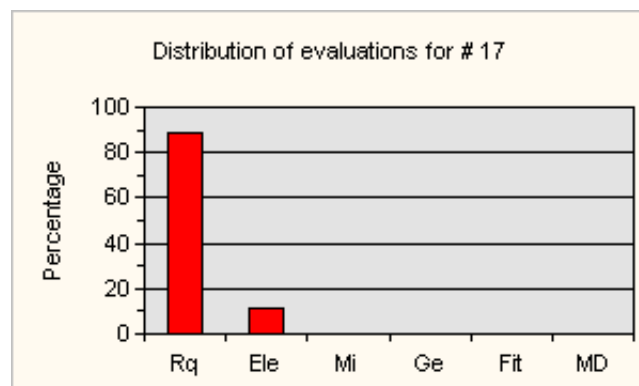
Median:	2					
Assessment:	Above average					
Student	VH	H	A	L	VL	MD
Responses:	5	4	5	3	0	0



VH=Very High, H=High, A=Average, L=Low, VL=Very Low, MD=Missing Data

17. What was your reason for taking the course?

Median:	1					
Assessment:	Well above average					
Student	Rq	Ele	Mi	Ge	Fit	MD
Responses:	15	2	0	0	0	0



Rq=Required for Major or Specialization, Ele=Elective for Major or Specialization, Mi=Elective or Minor, Ge=General Interest, Fit=Fit into Schedule, MD=Missing Data

LEGEND:

The term 'N/A' stands for 'Not Applicable'

The term 'MD' stands for 'Missing Data'

STATISTICS:

The total number students participating in the evaluations and the total number of classes used in the comparisons for this particular report are listed in the following table:

TOTALS	DEPARTMENT		FACULTY	
	Current Semester	All	Current Semester	All
# of Classes	26	827	405	12710
# of Participants	772	23184	11245	352883

NOTES:

1. The numbers quoted are actual numbers of respondents.

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- For more detailed information please click on this link: [Centre for Teaching & Learning Services \(CTLS\)](#).
 - Scanned version of the [Questionnaire Forms](#) are also available at the CTLS website.
 - To print this page click [here](#)

Note: Please use the **"Print Preview"** function in your browser to ensure the full contents will be printed. You may need to change the page setup (in your browser options) or even change the default values for the **margins** in order for the contents to fit within the page. Also, in order to print the charts properly, you need to activate the **"Print background colors and images"** option. The option is accessible via the Advanced tab from the Internet Options in Microsoft Internet Explorer.

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Concordia University Course Evaluation Report

CUPFA

PROF: MANUELA
GIROTTI

DEPT: MATHEMATICS AND
STATISTICS

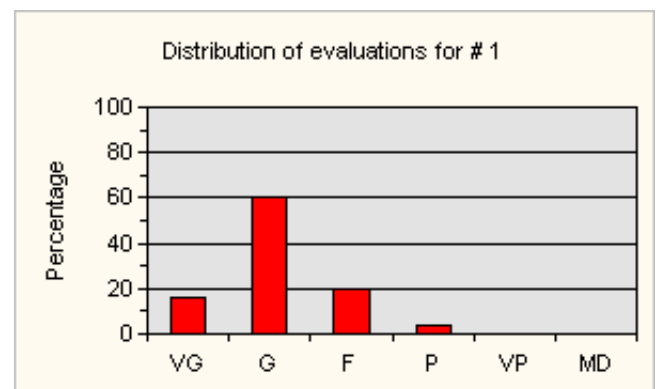
COURSE: MATH
205

SECTION: A **YEAR:** 2011 **TERM:** 2F

NUMBER OF EVALUATIONS: 1
NUMBER OF STUDENTS: 57
STUDENTS RESPONDING: 25
PERCENTAGE OF STUDENTS RESPONDING: 43.86%

1. Overall, this course has been...

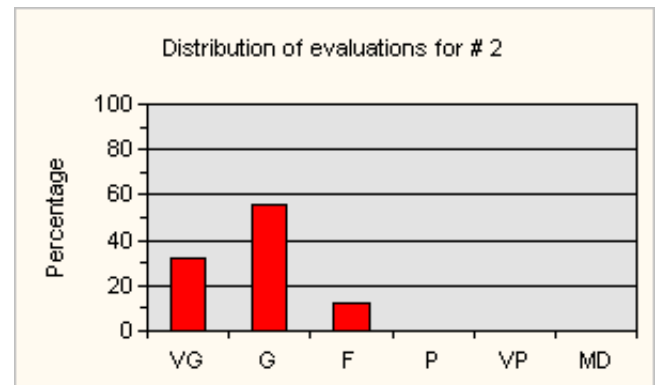
Median:	2					
Assessment:	Above average					
Student	VG	G	F	P	VP	MD
Responses:	4	15	5	1	0	0



VG=Very Good, G=Good, F=Fair, P=Poor, VP=Very Poor, MD=Missing Data

2. Overall, the instructor has been...

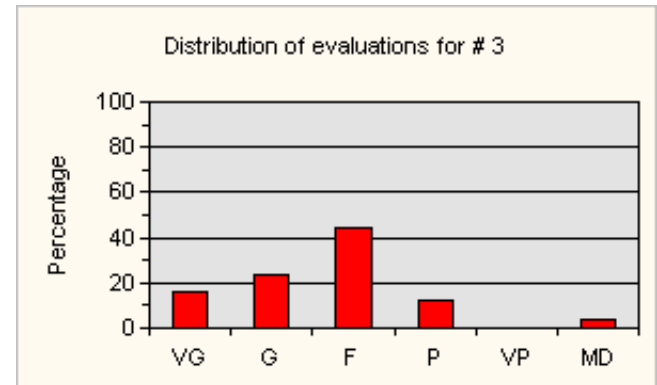
Median:	2					
Assessment:	Above average					
Student	VG	G	F	P	VP	MD
Responses:	8	14	3	0	0	0



VG=Very Good, G=Good, F=Fair, P=Poor, VP=Very Poor, MD=Missing Data

3. Overall, my learning has been...

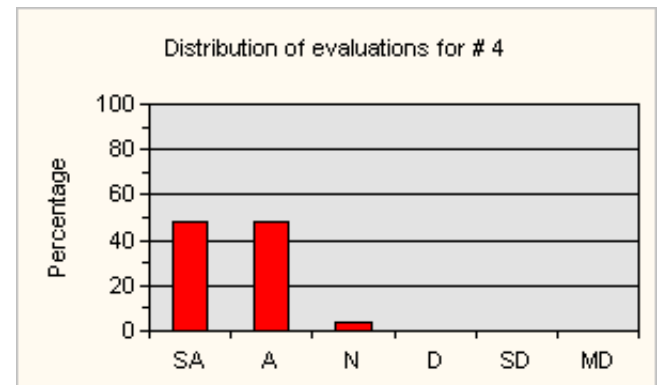
Median:	3					
Assessment:	Average					
Student	VG	G	F	P	VP	MD
Responses:	4	6	11	3	0	1



VG=Very Good, G=Good, F=Fair, P=Poor, VP=Very Poor, MD=Missing Data

4. Course outline and syllabus are clear, complete and well explained.

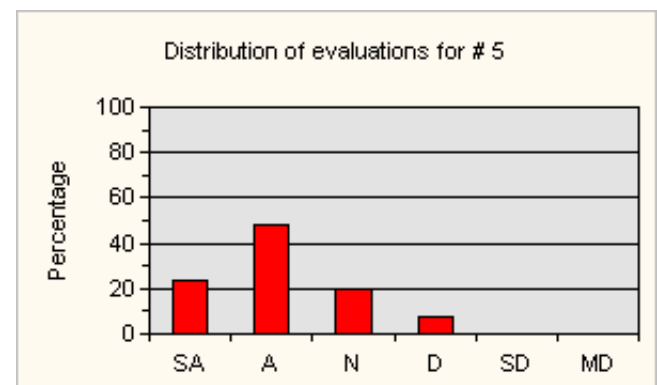
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	12	12	1	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

5. Course materials, text book or readings are useful or relevant.

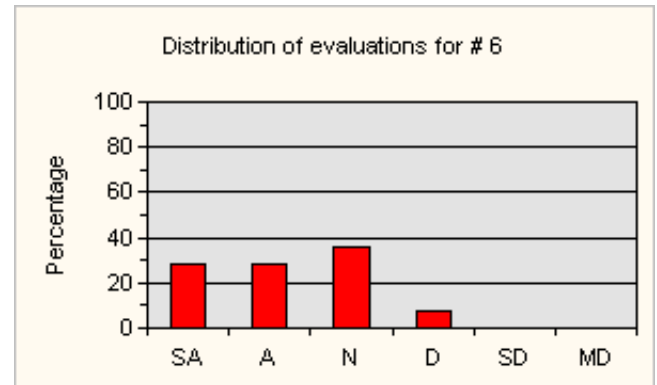
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	6	12	5	2	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

6. I have found this course intellectually challenging and stimulating.

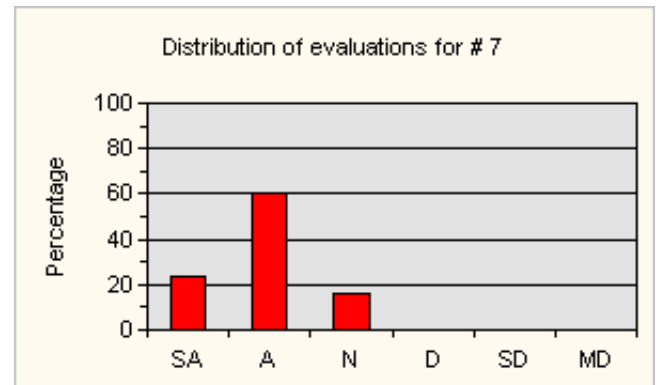
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	7	7	9	2	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

7. The course met the objectives as stated in the course outline.

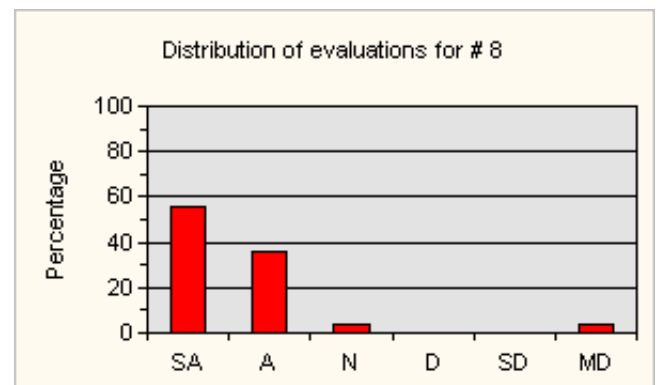
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	6	15	4	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

8. Instructor demonstrates a comprehensive knowledge of the subject matter.

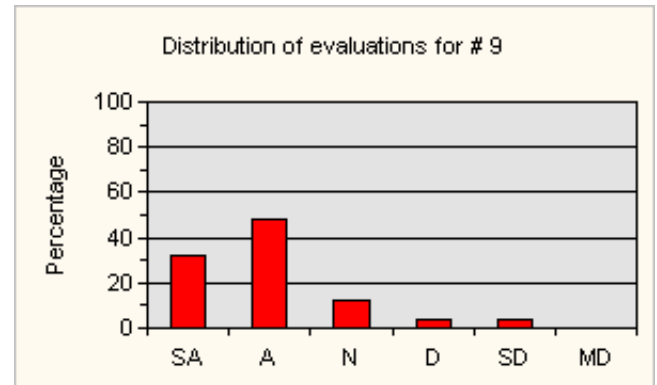
Median:	1					
Assessment:	Well above average					
Student	SA	A	N	D	SD	MD
Responses:	14	9	1	0	0	1



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

9. The instructor's explanations are clear.

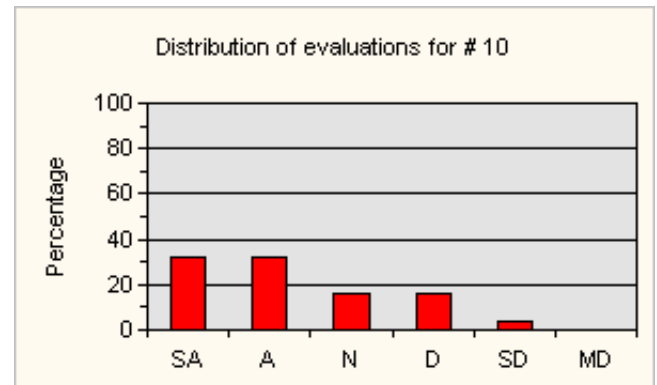
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	8	12	3	1	1	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

10. The instructor provides feedback in the form of exams and/or assignment grading.

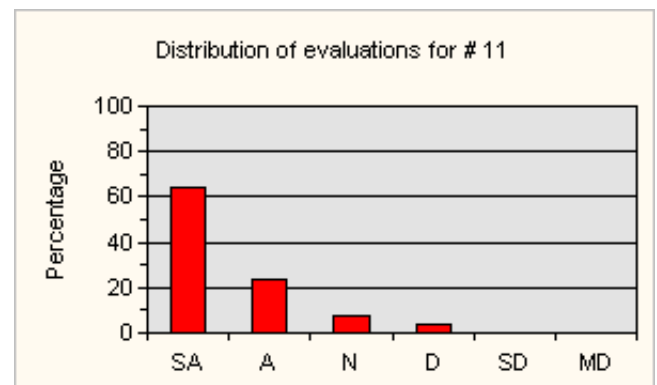
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	8	8	4	4	1	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

11. Students are encouraged to ask questions.

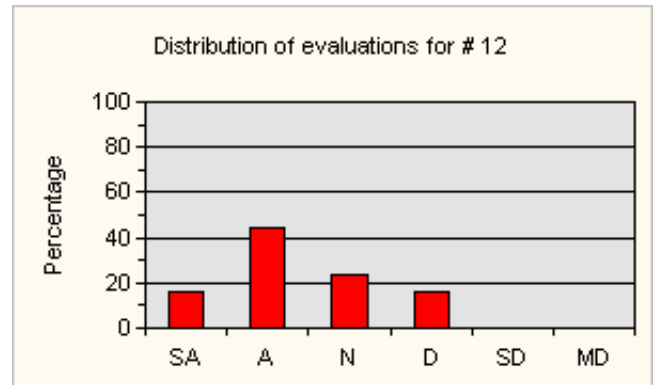
Median:	1					
Assessment:	Well above average					
Student	SA	A	N	D	SD	MD
Responses:	16	6	2	1	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

12. Students are encouraged to share their ideas and knowledge.

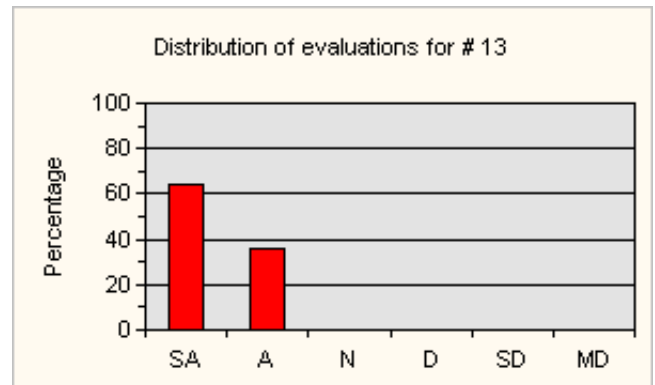
Median:	2					
Assessment:	Above average					
Student	SA	A	N	D	SD	MD
Responses:	4	11	6	4	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

13. The instructor is approachable.

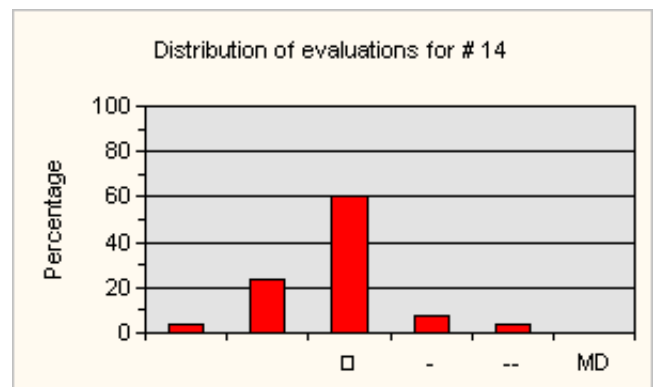
Median:	1					
Assessment:	Well above average					
Student	SA	A	N	D	SD	MD
Responses:	16	9	0	0	0	0



SA=Strongly Agree, A=Agree, N=Neither agree nor disagree, D=Disagree, SD=Strongly Disagree, MD=Missing Data

14. Overall, my involvement in this course has been...

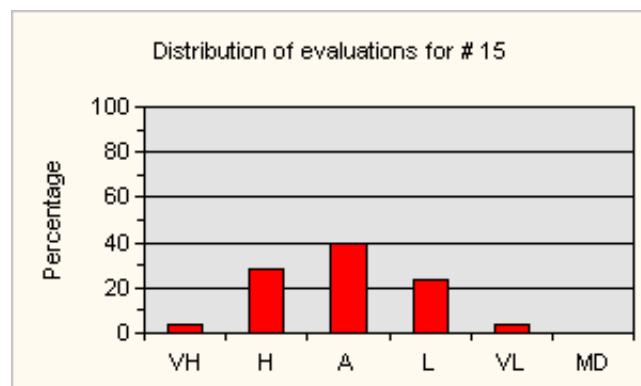
Median:	3					
Assessment:	Average					
Student	++	+	±	-	--	MD
Responses:	1	6	15	2	1	0



++=Well-Above Average, +=Above Average, ±=Average, -=Below Average, --=Well-Below Average, MD=Missing Data

15. What was your level of knowledge of the subject prior to taking this course?

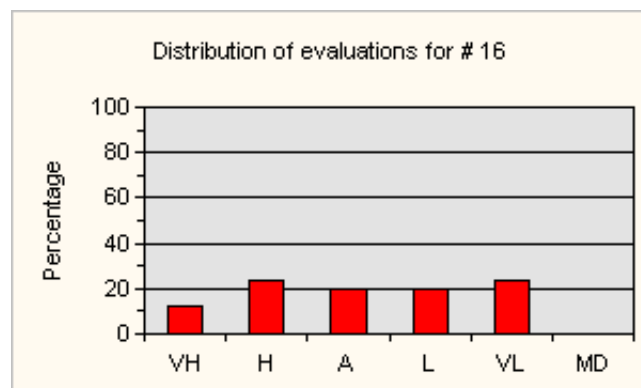
Median:	3					
Assessment:	Average					
Student	VH	H	A	L	VL	MD
Responses:	1	7	10	6	1	0



VH=Very High, H=High, A=Average, L=Low, VL=Very Low, MD=Missing Data

16. What was your level of interest in the subject prior to taking this course?

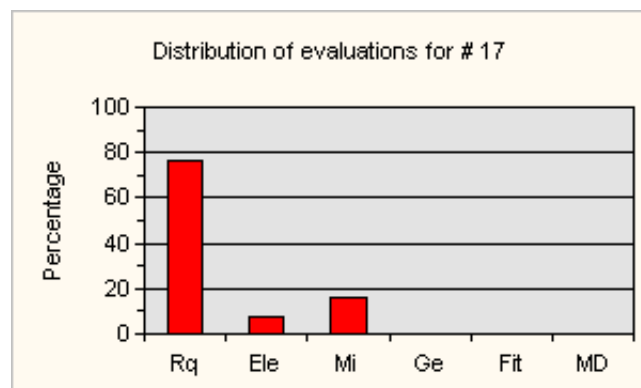
Median:	3					
Assessment:	Average					
Student	VH	H	A	L	VL	MD
Responses:	3	6	5	5	6	0



VH=Very High, H=High, A=Average, L=Low, VL=Very Low, MD=Missing Data

17. What was your reason for taking the course?

Median:	1					
Assessment:	Well above average					
Student	Rq	Ele	Mi	Ge	Fit	MD
Responses:	19	2	4	0	0	0



Rq=Required for Major or Specialization, Ele=Elective for Major or Specialization, Mi=Elective or Minor, Ge=General Interest, Fit=Fit into Schedule, MD=Missing Data

LEGEND:

The term 'N/A' stands for 'Not Applicable'

The term 'MD' stands for 'Missing Data'

STATISTICS:

The total number students participating in the evaluations and the total number of classes used in the comparisons for this particular report are listed in the following table:

TOTALS	DEPARTMENT		FACULTY	
	Current Semester	All	Current Semester	All
# of Classes	36	827	429	12710
# of Participants	1154	23184	12473	352883

NOTES:

1. The numbers quoted are actual numbers of respondents.

-
- For more detailed information please click on this link: [Centre for Teaching & Learning Services \(CTLS\)](#).
 - Scanned version of the [Questionnaire Forms](#) are also available at the CTLS website.
 - To print this page click [here](#)

Note: Please use the **"Print Preview"** function in your browser to ensure the full contents will be printed. You may need to change the page setup (in your browser options) or even change the default values for the **margins** in order for the contents to fit within the page. Also, in order to print the charts properly, you need to activate the **"Print background colors and images"** option. The option is accessible via the Advanced tab from the Internet Options in Microsoft Internet Explorer.

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Course Report

You are reviewing results for the following course, instructor, and academic term:

MATH369 Linear Algebra I, Section 005

Instructor: Manuela Girotti, Postdoctoral Fellow

College and Department: Natural Sciences, Mathematics

Term: Spring 2017

Course Reference Number: 20220

Enrollment: 25

Brief Summary of Submitted Forms

Survey Forms Submitted: 28

Scale: Excellent = 5; Above Average = 4; Average = 3; Below Average = 2; Poor = 1; NA = Not Applicable; NR = No Response

	5	4	3	2	1	NA	NR	
1. How well were the course objectives communicated to students?	5	11	4	1	0	0	7	Mean: 3.95
2. How well was the grading system communicated to students?	7	4	5	5	0	0	7	Mean: 3.62
3. How well did class sessions increase your understanding of the subject?	6	7	4	4	0	0	7	Mean: 3.71
4. How well did reading assignments increase your understanding of the subject?	3	3	8	1	1	5	7	Mean: 3.38
5. How well did other course assignments increase your understanding of the subject?	3	9	3	5	1	0	7	Mean: 3.38
6. How well did other learning resources used in this course — such as related websites, software, study guides, and media — increase your understanding of the subject?	3	5	4	0	1	8	7	Mean: 3.69
7. How well was feedback provided — such as reviews, quizzes, critiques, and homework — to help you track your progress?	9	5	2	5	0	0	7	Mean: 3.86
8. If you accessed course information through an online system — such as a website or RamCT — how do you rate the ease of finding information?	11	5	5	0	0	0	7	Mean: 4.29
9. How do you rate the clarity and completeness of instructions provided in the course for engaging in class activities and completing course work?	4	8	4	4	1	0	7	Mean: 3.48
10. How do you rate the intellectual challenge of this course?	14	5	0	0	1	0	8	Mean: 4.55
11. How do you rate this course?	4	5	7	5	0	0	7	Mean: 3.38
12. How do you rate the instructor's knowledge of the subject?	16	5	0	0	0	0	7	Mean: 4.76
13. How effectively did the instructor facilitate student learning?	7	7	4	3	0	0	7	Mean: 3.86
14. How do you rate the instructor's enthusiasm for teaching the subject?	12	4	4	1	0	0	7	Mean: 4.29
15. How well did the instructor organize the course?	10	6	2	2	1	0	7	Mean: 4.05
16. How prepared was the instructor for class sessions?	12	7	2	0	0	0	7	Mean: 4.48
17. How do you rate the instructor's effectiveness at managing class sessions?	11	5	5	0	0	0	7	Mean: 4.29
18. How do you rate the instructor's effectiveness at facilitating online and/or in-class interactions (communication, discussions, etc.)?	9	5	1	3	0	3	7	Mean: 4.11
19. How do you rate the instructor's fairness and impartiality in the assignment of grades?	11	4	4	1	1	0	7	Mean: 4.10

20. How well did the instructor create an atmosphere that was respectful of student opinions, ideas, and differences?	14	3	3	1	0	0	7	Mean: 4.43
21. How effectively did the instructor communicate?	4	8	7	2	0	0	7	Mean: 3.67
22. How do you rate the availability of the instructor to help students outside of class?	10	5	5	0	0	1	7	Mean: 4.25
23. How do you rate this instructor?	9	8	3	1	0	0	7	Mean: 4.19
24. How do you rate the overall quality of the classroom?	5	4	8	4	0	0	7	Mean: 3.48
25. How do you rate the quality of the equipment (computers, projectors, and so on) in the classroom?	6	5	9	3	0	1	4	Mean: 3.61
26. How do you rate your class attendance in this course?	14	6	1	0	0	0	7	Mean: 4.62
27. How do you rate your level of effort in this course?	11	7	2	0	1	0	7	Mean: 4.29
28. I am majoring in the department offering this course.	Yes	No	NR					
	3	18	7					
29. I expect to receive the following grade in this course.	A	B	C	D	F	S	U	NR
	2	7	9	2	0	1	0	7

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Course Report

You are reviewing results for the following course, instructor, and academic term:

MATH317 Advanced Calculus of One Variable, Section 001

Instructor: Manuela Girotti, Postdoctoral Fellow

College and Department: Natural Sciences, Mathematics

Term: Fall 2017

Course Reference Number: 63279

Enrollment: 19

Brief Summary of Submitted Forms

Survey Forms Submitted: 18

Scale: Excellent = 5; Above Average = 4; Average = 3; Below Average = 2; Poor = 1; NA = Not Applicable; NR = No Response

	5	4	3	2	1	NA	NR	
1. How well were the course objectives communicated to students?	2	1	6	2	0	0	7	Mean: 3.27
2. How well was the grading system communicated to students?	0	2	1	3	5	0	7	Mean: 2.00
3. How well did class sessions increase your understanding of the subject?	2	0	5	2	2	0	7	Mean: 2.82
4. How well did reading assignments increase your understanding of the subject?	1	1	4	1	1	3	7	Mean: 3.00
5. How well did other course assignments increase your understanding of the subject?	2	2	6	1	0	0	7	Mean: 3.45
6. How well did other learning resources used in this course — such as related websites, software, study guides, and media — increase your understanding of the subject?	1	2	3	1	0	4	7	Mean: 3.43
7. How well was feedback provided — such as reviews, quizzes, critiques, and homework — to help you track your progress?	1	2	2	4	2	0	7	Mean: 2.64
8. If you accessed course information through an online system — such as a website or RamCT — how do you rate the ease of finding information?	2	3	3	1	0	2	7	Mean: 3.67
9. How do you rate the clarity and completeness of instructions provided in the course for engaging in class activities and completing course work?	1	1	6	1	2	0	7	Mean: 2.82
10. How do you rate the intellectual challenge of this course?	11	0	0	0	0	0	7	Mean: 5.00
11. How do you rate this course?	1	1	6	2	1	0	7	Mean: 2.91
12. How do you rate the instructor's knowledge of the subject?	7	2	2	0	0	0	7	Mean: 4.45
13. How effectively did the instructor facilitate student learning?	2	1	2	4	2	0	7	Mean: 2.73
14. How do you rate the instructor's enthusiasm for teaching the subject?	1	2	6	1	1	0	7	Mean: 3.09
15. How well did the instructor organize the course?	1	4	5	0	1	0	7	Mean: 3.36
16. How prepared was the instructor for class sessions?	3	4	3	1	0	0	7	Mean: 3.82
17. How do you rate the instructor's effectiveness at managing class sessions?	3	1	4	1	2	0	7	Mean: 3.18
18. How do you rate the instructor's effectiveness at facilitating online and/or in-class interactions (communication, discussions, etc.)?	1	1	5	1	3	0	7	Mean: 2.64
19. How do you rate the instructor's fairness and impartiality in the assignment of grades?	2	3	4	2	0	0	7	Mean: 3.45

20. How well did the instructor create an atmosphere that was respectful of student opinions, ideas, and differences?	2	3	5	1	0	0	7	Mean: 3.55
21. How effectively did the instructor communicate?	0	2	5	3	1	0	7	Mean: 2.73
22. How do you rate the availability of the instructor to help students outside of class?	2	4	3	2	0	0	7	Mean: 3.55
23. How do you rate this instructor?	2	2	3	3	1	0	7	Mean: 3.09
24. How do you rate the overall quality of the classroom?	5	1	4	1	0	0	7	Mean: 3.91
25. How do you rate the quality of the equipment (computers, projectors, and so on) in the classroom?	6	2	4	1	0	0	5	Mean: 4.00
26. How do you rate your class attendance in this course?	8	2	1	0	0	0	7	Mean: 4.64
27. How do you rate your level of effort in this course?	8	2	1	0	0	0	7	Mean: 4.64
28. I am majoring in the department offering this course.	Yes	No	NR					
	7	4	7					
29. I expect to receive the following grade in this course.	A	B	C	D	F	S	U	NR
	2	4	5	0	0	0	0	7

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Course Report

You are reviewing results for the following course, instructor, and academic term:

MATH345 Differential Equations, Section 001

Instructor: Manuela Girotti, Postdoctoral Fellow

College and Department: Natural Sciences, Mathematics

Term: Spring 2018

Course Reference Number: 13644

Enrollment: 12

Brief Summary of Submitted Forms

Survey Forms Submitted: 10

Scale: Excellent = 5; Above Average = 4; Average = 3; Below Average = 2; Poor = 1; NA = Not Applicable; NR = No Response

	5	4	3	2	1	NA	NR	
1. How well were the course objectives communicated to students?	2	2	6	0	0	0	0	Mean: 3.60
2. How well was the grading system communicated to students?	2	4	4	0	0	0	0	Mean: 3.80
3. How well did class sessions increase your understanding of the subject?	3	4	3	0	0	0	0	Mean: 4.00
4. How well did reading assignments increase your understanding of the subject?	1	0	7	0	0	2	0	Mean: 3.25
5. How well did other course assignments increase your understanding of the subject?	2	2	6	0	0	0	0	Mean: 3.60
6. How well did other learning resources used in this course — such as related websites, software, study guides, and media — increase your understanding of the subject?	0	4	5	0	0	1	0	Mean: 3.44
7. How well was feedback provided — such as reviews, quizzes, critiques, and homework — to help you track your progress?	3	2	5	0	0	0	0	Mean: 3.80
8. If you accessed course information through an online system — such as a website or RamCT — how do you rate the ease of finding information?	3	1	4	0	0	2	0	Mean: 3.88
9. How do you rate the clarity and completeness of instructions provided in the course for engaging in class activities and completing course work?	1	4	5	0	0	0	0	Mean: 3.60
10. How do you rate the intellectual challenge of this course?	8	1	1	0	0	0	0	Mean: 4.70
11. How do you rate this course?	2	3	5	0	0	0	0	Mean: 3.70
12. How do you rate the instructor's knowledge of the subject?	9	1	0	0	0	0	0	Mean: 4.90
13. How effectively did the instructor facilitate student learning?	3	4	3	0	0	0	0	Mean: 4.00
14. How do you rate the instructor's enthusiasm for teaching the subject?	5	5	0	0	0	0	0	Mean: 4.50
15. How well did the instructor organize the course?	3	5	2	0	0	0	0	Mean: 4.10
16. How prepared was the instructor for class sessions?	8	2	0	0	0	0	0	Mean: 4.80
17. How do you rate the instructor's effectiveness at managing class sessions?	4	4	2	0	0	0	0	Mean: 4.20
18. How do you rate the instructor's effectiveness at facilitating online and/or in-class interactions (communication, discussions, etc.)?	2	4	3	0	0	1	0	Mean: 3.89
19. How do you rate the instructor's fairness and impartiality in the assignment of grades?	5	2	3	0	0	0	0	Mean: 4.20

20. How well did the instructor create an atmosphere that was respectful of student opinions, ideas, and differences?	6	3	1	0	0	0	0	Mean: 4.50
21. How effectively did the instructor communicate?	3	5	2	0	0	0	0	Mean: 4.10
22. How do you rate the availability of the instructor to help students outside of class?	7	1	1	0	1	0	0	Mean: 4.30
23. How do you rate this instructor?	7	2	1	0	0	0	0	Mean: 4.60
24. How do you rate the overall quality of the classroom?	0	0	7	3	0	0	0	Mean: 2.70
25. How do you rate the quality of the equipment (computers, projectors, and so on) in the classroom?	0	0	7	3	0	0	0	Mean: 2.70
26. How do you rate your class attendance in this course?	8	0	2	0	0	0	0	Mean: 4.60
27. How do you rate your level of effort in this course?	4	3	1	1	0	0	1	Mean: 4.11
28. I am majoring in the department offering this course.	Yes	No	NR					
	8	2	0					
29. I expect to receive the following grade in this course.	A	B	C	D	F	S	U	NR
	2	3	2	1	1	0	0	1

MATH 345 Differential Equations

Spring 2018

Instructor:	Dr. Manuela Girotti; office: Weber 223C email: manuela.girotti@colostate.edu
Time:	Mon-Tue-Wed-Fri 1:00pm-1:50pm
Location:	Engineering E 206
Office hours:	Monday and Friday 4:30pm–5:30pm in Weber 008 (basement)
Textbook:	<i>Differential Equations and Their Applications. An Introduction to Applied Mathematics</i> , by Martin Braun 4th edition, Springer New York, Texts in Applied Mathematics Series #11 ISBN 978-1-4612-4360-1
Catalog description:	first and second order equations, Laplace transforms, first order systems of equations, numerical methods, applied linear algebra, linearization.
Overview:	The construction of mathematical models to address real-world problems has been one of the most important aspects of each of the branches of science. It is often the case that these mathematical models are formulated in terms of equations involving functions as well as their derivatives. Such equations are called differential equations. If only one independent variable is involved, often time, the equations are called ordinary differential equations. The course will demonstrate the usefulness of ordinary differential equations for modelling physical and other phenomena.
Prerequisites:	good knowledge of Calculus I and II (differentiation and integration of elementary functions) and Linear Algebra (matrices, eigenvalues, linear systems).



- Homework:** you will be required to hand in **5 assignments** along the semester.
- The assignments will be posted on the Canvas website with due dates (please, check the Canvas calendar often!) and they reflect the content of the course.
- No late assignments will be accepted.
- If you are unable to submit a hard copy assignment, you can also scan it and send it me by email, no later than the due date and due time.
- Discussions and work group are highly encouraged, however the final submission has to be personal and show understanding of the material. Grades will be posted on Canvas.
- Computer Lab:** There will be **2 computer labs on Friday March 30th, 2018 and Friday April 20th, 2018** (regular class on other days).
- On these days the class will meet in **Weber 205**. In the first lab session you will be given a username and a password for the computers in the lab.
- Please, do not share this information with others.
- The lab classes will be used to visualize concepts seen in class and become familiar with computer software to solve differential equations. In this course we will use mainly Matlab[®] (and Mathematica[®]).
- In addition to the packages mentioned above, many illustrative examples can be found at Addison-Wesley's [Interactive Differential Equations](#) website.
- You are encouraged to explore these examples as you proceed in the course.
- Midterm exam:** There will be **two midterm exams on Friday March 9th, 2018 and on Monday April 16th, 2018**.
- They will be held during class hours (1pm-1:50pm) in the usual classroom E 206.
- Final exam:** the final examination will cover material from the entire course. It will be a closed-book exam, no notes are allowed.
- The final exam is scheduled for **Tuesday May 8th, 2018 between 4:10pm and 6:10pm**. It will be held in class (room E 206).
- If you have time conflicts with other examinations, please notify me as soon as possible, in order to arrange for an alternative date for your exam.

Grading scheme:	<p>The final grade will be built up from the grades coming from assignments, midterm and final exams in the following percentage:</p> <ul style="list-style-type: none">20% assignments,20% for each of the midterm exams,40% final exam. <p>Please, disregard the grading algorithm on Canvas, because it is set automatically and does not respect the grading scheme of this class.</p>
Calculators:	<p>unless otherwise stated, basic 4-function calculators and scientific calculators (like Sharp EL 531 and Casio FX 300MS, for example) are permitted in class tests and final examination.</p>
Academic Integrity:	<p>this course will adhere to the CSU Academic Integrity Policy as found on the Students' Responsibilities page of the CSU General Catalog and in the Student Conduct Code (see http://tilt.colostate.edu/integrity).</p> <p>Besides official proceedings, you should also be aware that you will face important consequences for misconducts, like cheating and plagiarism: this course is a precious opportunity for you to learn something new and valuable. It's an investment on your future. Failing to acquire this knowledge would be an unfortunate loss for you.</p>
Disabilities:	<p>Colorado State University is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations need to first contact Student Disability Center before requesting accommodations for this class (see https://disabilitycenter.colostate.edu/).</p> <p>Please, also get in touch with me so we can to discuss together the needed accommodations.</p>

Diversity and Inclusivity: I am committed to ensure that all students from any background and perspective are well served by this course, and that their learning needs is addressed both in and out of class. It is my intent to present material and activities that are respectful of any diversity: race, ethnicity, sex, gender expression, age, religion, culture, disability and socio-economical status. Additionally, if any class meeting or examination conflict with your religious events, please let me know, so that arrangements can be made for you.

IMPORTANT: note that there is no “100% final exam” option in this course. The term work contributes 60% to the final grade. Therefore, active participation in classes and continuous work on the course material during the semester is essential for success in this course.

Tentative (and ambitious) outline of the course

We will cover Chapters 1-4 of the book. Here is the list of topics:

1. First-order differential equations
 - 1.1. Introduction
 - 1.2. First-order linear differential equations
 - 1.3. The Van Meegeren art forgeries
 - 1.4. Separable equations
 - 1.5. Population models
 - 1.6. The spread of technological innovations
 - 1.7. An atomic waste disposal problem
 - 1.8. The dynamics of tumor growth, mixing problems, and orthogonal trajectories
 - 1.9. Exact equations, and why we cannot solve very many differential equations
 - 1.10. The existence-uniqueness theorem; Picard iteration
 - 1.11. Finding roots of equations by iteration. Newton's method
 - 1.12. Difference equations, and how to compute the interest due on your student loans
 - 1.13. Numerical approximations; Euler's method. Error analysis for Euler's method
 - 1.14. The three term Taylor series method
 - 1.15. An improved Euler method
 - 1.16. The Runge-Kutta method
 - 1.17. What to do in practice
2. Second-order linear differential equations
 - 2.1. Algebraic properties of solutions
 - 2.2. Linear equations with constant coefficients. Complex roots. Equal roots; reduction of order
 - 2.3. The nonhomogeneous equation
 - 2.4. The method of variation of parameters
 - 2.5. The method of judicious guessing
 - 2.6. Mechanical vibrations. The Tacoma Bridge disaster. Electrical networks
 - 2.7. A model for the detection of diabetes
 - 2.8. Series solutions. Singular points; Euler equations. Regular singular points; the method of Frobenius. Equal roots, and roots differing by an integer
 - 2.9. The method of Laplace transforms
 - 2.10. Some useful properties of Laplace transforms
 - 2.11. Differential equations with discontinuous right-hand sides
 - 2.12. The Dirac delta function
 - 2.13. The convolution integral

- 2.14. The method of elimination for systems
- 2.15. Higher-order equations
- 3. Systems of differential equations
 - 3.1. Algebraic properties of solutions of linear systems
 - 3.2. Vector spaces
 - 3.3. Dimension of a vector space
 - 3.4. Applications of linear algebra to differential equations
 - 3.5. The theory of determinants
 - 3.6. Solutions of simultaneous linear equations
 - 3.7. Linear transformations
 - 3.8. The eigenvalue-eigenvector method of finding solutions
 - 3.9. Complex roots
 - 3.10. Equal roots
 - 3.11. Fundamental matrix solutions; e^{At}
 - 3.12. The nonhomogeneous equation; variation of parameters
 - 3.13. Solving systems by Laplace transforms
- 4. Qualitative theory of differential equations
 - 4.1. Introduction
 - 4.2. Stability of linear systems
 - 4.3. Stability of equilibrium solutions
 - 4.4. The phase-plane
 - 4.5. Mathematical theories of war. L. F. Richardson's theory of conflict. Lanchester's combat models and the battle of Iwo Jima
 - 4.6. Qualitative properties of orbits
 - 4.7. Phase portraits of linear systems
 - 4.8. Long time behaviour of solutions; the Poincare-Bendixson Theorem
 - 4.9. Introduction to bifurcation theory
 - 4.10. Predator-prey problems; or why the percentage of sharks caught in the Mediterranean Sea rose dramatically during World War I
 - 4.11. The principle of competitive exclusion in population biology
 - 4.12. The Threshold Theorem of epidemiology
 - 4.13. A model for the spread of gonorrhea

A diary of the lectures will be regularly kept on the Canvas calendar with the sections covered in each class. Please, refer to that when preparing for the final exam because that will be the official and ultimate syllabus for the class.

Disclaimer: the instructor reserves the right to make changes to the course outline and course content should this be necessary for academic or other reasons. Every effort will be made to minimize such changes.