

Teaching Portfolio

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1. TEACHING PHILOSOPHY

I love mathematics. I love it with passion. I love the beauty of the thought, the incredible ingenuity with which many problems have been solved. Indeed, Mathematics is a construction. Its foundation lies on a few premises; the rest is a creation built upon them.

I understood this fact very early in my career, as I was learning about the axioms. We slowly built all the theory that I know, based on just those few axioms – and a big tool: logical thought.

Thus, as I do mathematics, either solving problems or doing research, I feel like I am in a game. I command the rules, so I am the master of the game. The game is a puzzle, and the solution is victory. The more intricate the problem, the sweeter the victory is.

I want to transmit this enthusiasm to my students. For many, mathematics is an arduous task. I want to change this perspective. I want to offer them my point of view, help them realize that they too are the masters of the game. They have the tools. There is nothing they can't do. My job is to help them see that they have this potential and to help them develop it. Realizing this is an empowering feeling. It gives the students confidence. They **can** do the problems, they **can** solve the puzzles, they **are** the masters of the game.

It is fundamental not just to provide the students with the mathematical tools to solve specific sets of problems, but to train them on how to think. It is fundamental to me that the students develop the intellectual independence that will allow them to ask new questions and gain an intellectual curiosity that will take them from what they know to what they don't know. It is this training from which they will benefit most and what they will take with them to whatever endeavors they will engage in.

To achieve these objectives, the teaching has to be close and personal. My classes are hands-on sessions in solving problems with active student participation. I engage the students by making them present their work to the rest of the students on a regular basis, by making them work on discovery-type projects and by insisting that they communicate with me either personally or by e-mail.

I feel that the use of technology in the classroom is essential for the preparation of students to compete in today's world. Whether or not my courses are assigned a computer lab, I require the students to work with the computer as long as it is appropriate for the course work. I also insist that they get familiar with the internet. For this purpose I make myself available by e-mail so that they can contact me outside

office hours and I maintain a web-page with information about my activities as well as course related activities.

It is important for me to be able to reach all of my students. My ideal is to achieve a close mentoring relationship with the students because I feel that talking to me or any other instructor one on one is the best way to self improve. In a one on one relation it is easier to see the problems the particular student has and give suggestions that fit that student best.

2. TEACHING RESPONSIBILITIES

2.1. Courses. My teaching responsibilities are two courses per semester plus advising students at the undergraduate and graduate level and teaching reading courses as needed. Also, when teaching large courses, my responsibility includes supervising the Teaching Assistants assigned to my course.

I teach a variety of undergraduate and graduate courses in the department with a concentration in probability and statistics. With the exception of two, all the courses I taught so far were required courses. See Appendix A for a listing of all my courses. I also teach reading courses as necessary. See also Appendix A for the reading courses I mentored so far.

I have served in the PhD committee of Steve Bourgault (PhD defense), Keneth Baum: Lie Groups (oral exam), Chen Jianbin: Markov Chains MonteCarlo (oral exam), John Holcomb: Statistics (PhD defense); and the master exam of (name).

2.2. Other Responsibilities. Besides teaching courses and mentoring students, it is part of my responsibilities to engage in other scholarly activities. I am a member of the Undergraduate Curriculum Committee, I am the Department's Liaison with the Mathematical Association of American and I participate in the following programs.

1. **Honors Program** Being a member of the Undergraduate Committee has inspired me to become involved in the Honors Program. Starting Fall 97, I became the Honors Program Advisor, and starting Fall 98 I will teach the Honor's Calculus Classes.
2. **Actuarial Program** The Actuarial Program was developed in conjunction with the Economic Department. Currently in the Mathematics Department Dr. Goldstein and myself are the directors of the program. We teach the core courses of the program and are involved in redesigning it to fit the revisions the Society of Actuaries has done to their program.

3. **Undergraduate Conference** I am the local organizer of the Hudson River Undergraduate Mathematics Conference, a conference for undergraduate research. I am promoting undergraduate research in the department, but as a graduate institution our strength is our graduate program. Each year I invite the graduating Ph.D's to present their work at the conference as a means to become known to the mathematical community and improve their chances for work in academia. Last year we had three graduate students giving talks: Christa, Melisa and Also, I teach the Senior Seminar in a effort to inspire undergraduate students to do research in mathematics.
4. **Sonia Kovalevsky Day** Together with the chairperson, Tim Lance, and a graduate student, Althea Bartley, we are developing the "Sonia Kovalevsky Day" program, sponsored by the Association for Women in Mathematics", to attract women at the High School level into Mathematics and Sciences. This program will run for the first time during Fall 98. See Appendix E.

3. TEACHING METHODOLOGY

In the past, I used to use a predominantly traditional lecture approach in my classes. However, in the recent years I started changing my teaching style in an effort to better motivate and involve the students. My new approach is a combination of the traditional lecture style with the new participatory technique of making the students come up to the blackboard to explain their work to their fellow students. In conjunction with this, I regularly assign projects which use the technology appropriate for the corresponding course. Please see Appendix C for samples of projects.

My classes have the following components:

1. **Traditional lecture time:** Since I have changed my teaching approach to make classes hands-on problems sessions, I now reduce the length of the lectures to the minimal necessary to introduce a topic, or concept. The in-depth study of the particular topic is then developed in the problem discussion portion of the class.
2. **Problem discussion time:** During this period, I require the students to come up to the blackboard to explain their assignments. At least 5 students are required to come up to the blackboard each class. Since this method shortens the lecture time, I use the discussion to expand on the lecture topics. For example, I taught the basic definitions of annuities to the students and assigned them problems to deal with all annuity values on any dates:present

values more than one period before the first payment date, future values more than one period after the last payment date and current values between the first and last payment dates. This exercise teaches the students to think because they can't just apply the formula for annuities, they have to connect it with what they previously learned about present values and future values.

The student participation has the following advantages:

- (a) breaking the students' passiveness,
- (b) making the students active participants of the learning process,
- (c) helping the instructor see the problems the students may have with a particular topic right away so that the instructor can redirect the student towards the right approach to the solution of a problem,
- (d) helping students develop communication skills, as they have to explain their work to their fellow students,
- (e) helping the students become an observer of their own thought process.
- (f) helping the students develop confidence in themselves and in their abilities.

As a means to enhance and complement the teaching, I frequently assign Projects. The nature of the projects vary according to the course. In most courses, Calculus, Linear Algebra, or the Statistics courses, the project contains discovery-type problems. They frequently use technology, like the computer algebra system Maple, or the statistical package Minitab.

I feel that it is important for the students' future to get familiar with the computer and different software. However, I don't want to distract the students with having to learn too much computer programming. I keep the learning of the computer language to the minimum necessary to do the assignments. If they wish, I provide them the tools to continue exploring the use of the programs on their own.

Projects

I use the projects in many situations. For example I use them to address a topic that is cumbersome to cover in a regular class period because of its computational nature. For example, learning about Newton's Method is better done on their own with the computer (see Appendix C.1).

Or I use the projects to explore a specific topic like the notion of Limit (see Appendix C.2) or to cement a concept (see Appendix C.3) or

technics as is necessary in the Theory of Interest course (see Appendix C.4).

The projects have been useful in motivating the students in learning mathematics by solving discovery-type problems and problems related to situations outside mathematics. See Appendix C.5.

Examinations

In my classes I have examinations roughly every month. In Appendix B you see that in most courses I have 4 Exams during the semester. For sample Exams, please refer to Appendix I.

I find that frequent evaluations are more effective since many students tend to study only when they are forced to, that is, at the last minute the day before the exam.

Comment from a student in a graduate class: “Prof. Reinhold gives three to four exams through out the semester. These exams motivate her students to keep up with the material.”

The Examinations are one to one and a half hours in-class exams; and in some instances, they also contain a takehome part.

Contact with students

I encourage the student to talk to me outside the class, either during office hours or by e-mail. I also maintain a web-page to communicate information about the courses. Some times I also post solutions to problems. See my web-page <http://math.albany.edu:8000/reinhold>, the section under courses.

The personal teaching methodology has been very fruitful for me. The students cannot get so easily lost in anonymity. Besides, this method of teaching is not concentrated on a fraction of the students but rather it reaches each and every student in my classes. Time and time again, I find that focalizing my efforts into better integrating the students’ participation into my classes, I can better reach the students and I can offer a real opportunity to all the students that come to SUNY with a variety of backgrounds.

A Special Case: Teaching with Maple

Linear Algebra in The Maple Classroom: I taught this course in Spg 96. It was my first experience at teaching in a “laboratory” setting. I was forced to redesign my teaching methodology for the computer lab environment as the students learned in a different way exploring topics with the computer. I had to devise a set of discovery-type notes for each class with the corresponding set of problems of conceptual type and computational type. See Appendix D for samples of notes, and

section 6 for comments of other faculty about the methodology in the laboratory setting.

4. OUTSIDE RECOGNITION

In Fall 97, I was nominated by the chairman of the Department of Mathematics for the Excellence in Teaching Award. The recipient of the award has not been decided at this time. See Appendix F for the material related to the nomination: letters the students and faculty wrote in my behalf.

Comment from the Chairman, Tim Lance, in the nomination letter: “Dr. Reinhold is a superb instructor at both the undergraduate and graduate levels . . . In all of them her approach is the same. She brings her passion for the subject and belief in the students to every class. She works extremely hard for each class, pushes the students, often to levels they didn’t realize they could reach, and provide them all the support needed to get there.”

5. EVALUATION OF MY TEACHING

Teaching is very important to me. I put a lot of time, effort, energy and emotion in it. I want to be one of the best teachers my students have ever had. And I have some success in this respect. Here are some of the student’s opinions:

- “Ms. Reinhold never seemed to exhaust the way she could explain a problem we might be having in a particular area in the course that many found hard to grasp.”
- “Ms. Reinhold was excellent. I really enjoyed being in her class. I found her to be very informative and helpful.”
- She was a very good teacher, had good communication skills and made the class enjoyable. It was always a pleasure to come to math class. Hopefully I’ll be able to be in a future class taught by her.”
- “The instructor was very helpful and very much available outside of class for extra help. She definitely challenges her students especially on exams. She is very clear and makes sure we understand the topic before moving on; yet we are on schedule.”
- “Instructor was well prepared in advance. Communicated abstract ideas well. Course was very challenging.”
- “Even though I dislike math and this course was an elective, Prof. Reinhold made the course interesting.”
- “Well prepared and available to students. She enjoys what she is doing and the material and conveys this to the students.”

- Ms. Reinhold is an excellent teacher. . . . I look forward to seeing her again.”

The Department of Mathematics uses course evaluations in essay format. At the bottom of the form, the student gives an overall rating of the instructor, ranging from very effective (5) to very ineffective (0).

Below are the averages for each course. (needs to be updated):

Fall '92			Spring '93		
220	(17)	4.5	214	(11)	4.5
367	(20)	4.2	367	(11)	3.5
Fall '93			Spring '94		
108	(38)	3.0	214	(14)	4.3
669	(5)	3.8	760	(5)	3.8
Fall '94			Spring '95		
106	(14)	3.3	481A	(9)	4.8
362	(19)	4.2	812	(4)	4.5
481A	(2)	4.5			
Fall '95			Spring '96		
112	(14)	3.8	220	(14)	3.9
554	(16)	2.8	555	(6)	3
Fall '96			Spring '97		
301	(11)	3.7	760B	(4)	4.5
669	(4)	4.25	112	(29)	4.2

The Department conducts peer reviews only in preparation for tenure or promotion evaluations. That is, roughly every two years during the tenure process. So far I have had only one of these reviews. Here are some comments of Professor Ted Turner, who visited the classes I was teaching at the time. See Appendix H for complete information about his review.

“I was impressed at how solid a grasp the students had of both the ideas and the techniques. Most of the class was spent in working through a problems set that she had handed out several classes earlier, with the points of theory reviewed as they were needed in the solution. Most impressively, fully two thirds of the dozen students were actively involved in the discussion, both asking and answering questions. It is clear that the rapport she has with the class is tremendous.”

I regularly participate in seminars where I present my work or work related to it. Here is a comment from Prof. Ben Jamison regarding my expositions: “In a series of talks, she presented a remarkable recent

result of Prof. Bourgain. As early as fifteen minutes into her first lecture it was obvious to all that we were in the hands of a master expositor. In her lectures she took a long, technically difficult proof, reorganized it, and presented it with clarity, elegance and spirit. It was a bravura performance. “

6. TEACHING WORKSHOPS ATTENDED

1. **Teaching Workshop for Foreign Students**, the Ohio State University, Summer 1986.

This workshop was designed to prepare foreign teaching assistants at the Ohio State University to teach undergraduate students at that institution. It taught us how to organize classes and how to be efficient in the use of the blackboard. It taught us what to expect from students and what things were not acceptable. For example, I learned that one should not embarrass students with questions (pay attention to the way the questions are phrased) so that the questions are not intimidating but invite a response. Always reward the students by emphasizing that the question asked was a good question.

2. **The Teaching Portfolio by Peter Seldin**, University at Albany, SUNY, Jan 1998.

The workshop was a four day writing intensive personal development seminar where we were instructed and guided on how to build our own teaching portfolios. This portfolio is its final result.

7. TEACHING GOALS FOR THE FUTURE

1. **Goals for the next 5 years:**

As a result of attending the Teaching Portfolio Workshop, I realized the need for documenting my teaching activities. In the coming years I intend to

- (a) develop a database with significant samples of the students' work,
- (b) develop a database with assessments of my classes that specifically addresses my different teaching goals, and
- (c) learn how to better organize group work activities in-class and outside class.

2. **Goals for the current year:**

I plan to keep improving my teaching methodology focusing mostly on conceptual learning. This semester I will:

- (a) keep improving the methodology of student participation,

- (b) develop methods of conceptual learning. I find that many times the students fail at grasping the basic notions with the consequence that they don't develop a cognitive structure from where to build subsequent knowledge. I plan to implement the following strategies as a way to address this problem:
- (i) have weekly quizzes where the students have to explain in their own words 5 definitions,
 - (ii) introduce a writing intensive part in the projects where they have to explain why they did what they did, and and explain why the results obtain are reasonable; and
 - (iii) ask conceptual questions at the beginning of each class period and continue the lecture from their responses.