

# EDUCATION BULLETIN

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**D**r. Mary MacLaughlin, Geological Engineering Department Head and Professor at Montana Tech, has been able to incorporate almost all of the different Rocscience programs into the various courses she teaches, and enjoys the enrichment of her classroom that they provide. She and her students greatly appreciate the quality and variety of these user-friendly, affordable engineering tools.

*As the first subscriber to the Rocscience Education Program, what first drew you to the program?*

**Dr. Mary MacLaughlin (MM):**

The program opened up a huge number of things that I could use in my classes at a very low cost. I had originally bought *Dips* and *Phase<sup>2</sup>* before the Education Program was around, as I needed them for field work and my Numerical Modelling. I already knew that these two Rocscience programs were student and user friendly, but was struggling to afford the programs individually.



I consider this program to have been a huge contribution to the educational component of what we offer to the students.

“ *Now that the Education Program is available, it is much easier to incorporate these programs into my classes and try out new things that I would have never been able to do before.* ”

*How have your teaching methods changed throughout your career?*

**MM:** Starting out, I relied a lot on lectures, packing a lot of stuff into classes. I have changed my gears a little bit. Now I try not to cover as much material, but go into more depth instead. I teach in a more integrated way rather than separating the components. I introduce the topic, discuss it, and then go straight to the computers to do some analysis and design. I have been lucky enough to be able to install some computers in my classrooms. This allows an interactivity to grow in the classroom, allowing the students that instant gratification that they desire and need.

This wouldn't have been possible without the programs that Rocscience offers.

*What are some of your greatest challenges in teaching Geological Engineering? Greatest rewards?*

**MM:** Most engineers get to work with products that have well known properties, which they can look up and find all the specifications for.

“ *Our main challenge as geological engineers is the fact that our materials are made by nature rather than by manufacturing processes.* ”

As geological engineers we have to first determine what the materials are at the site and then how they are going to behave, depending on the loading conditions and many other things in the environment. These challenges drew me to the field but it is also these challenges that make it hard to get it across to the students.

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A lot of students just want the numbers, but the students that really shine are the ones that understand that it is not a “cookbook” engineering field.

take measurements and collect samples for lab testing, and then decide which software (*Slide, Dips, RocFall, etc.*) is appropriate for modelling the slope.

*Your research interests include rock mechanics. Can you tell us about your most exciting research finding?*

**MM:** I haven't made any major groundbreaking contributions to rock mechanics, but what I am really proud of is my contribution to the DDA validation efforts, to the understanding of how DDA really works. It is kind of an obscure method, but it is very interesting. There were a lot of misunderstandings early on due to language barriers. I think that my validation efforts have helped clarify a lot in this area.



*What is your favourite course to teach and why?*

**MM:** I love my modelling class and I am a modeller at heart, but I have to say my favourite course to teach is Slope Stability. The reason I really enjoy this course is because when I first came to Montana Tech, it was a 2-credit rock course. The very next year, I changed it to a 3-credit rock and soil slope stability course with a lab. When I was able to do that, I was able to teach it with the whole perspective of stability and the different materials that you might run into. By adding the lab components, it allowed us to go out into the field,

It just allows this broad and integrated way of teaching and learning.

**“ I can just see that the future is going to be good, because the students that are going out there have the knowledge that they need to succeed. ”**

*Can you tell us about some of the most interesting aspects of your job?*

**MM:** I love interacting with the students and teaching them with the material that I was taught.

*How has the education you received as a student influenced the way you teach and your career?*

I don't know how it happened, but I was fortunate to have gone to one of the best schools in rock mechanics in the world for my undergrad, the University of Minnesota. My professors, Fairhurst, Crouch and Starfield really instilled in me the value of modelling, its uses in different fields, Mining and Civil in particular. With their encouragement, I then went to the University of California, Berkeley, one of the other big players in rock mechanics in the United States. This was very helpful for me because, at the time, I didn't really understand what a Masters and PhD were all about, and they seemed to see that potential in me.

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The whole Berkeley experience was just awesome (I hate to use that word because it has been overused) but between the students and staff like Professors Seed and Goodman, Berkeley really was a great experience. There is absolutely a reason there are so many Berkeley grads in academia.

*If you could stress one thing upon your students at graduation, what would it be and why?*

**MM:** I have been thinking about this since graduation is coming up. It is hard going out to the field in your early years because everything is so new and nothing seems directly applicable to stuff you did in school, but I think I would say, trust the fundamentals that you were taught because if you really know the basics, you can build on those basics to solve any of the problems that are out there.

*What are some of your goals for the future?*

**MM:** I have two goals for the future. One is more acceptance of numerical modelling in the mining industry. I think some of the other countries like Canada and Australia are ahead of the U.S. in that way, but my goal is trying to get the mining companies to appreciate that modelling can be beneficial in terms of both safety and

economics. My second goal is to promote rock mechanics in and amongst college students. It is a pretty small field and a lot of schools are losing rock mechanics. I will try to carry that flag for a couple more decades at least.

**“ I think the Rocscience Education Program is an absolutely fantastic tool and I am glad that I was able to be the first subscriber, I am very proud of that. ”**

*What advice and comments would you give to professors looking to incorporate the Rocscience Education program into their teaching programs?*

**MM:** I've been nothing but just pleasantly surprised every year with new tutorials coming out and new features for students to use, while at the same time, the software is not getting more complicated; it is only becoming easier and easier to use. I really appreciate the fact that you guys go out of your way to provide a phenomenal tool for education. My IT person who installs the software also only has good things to say about installing the programs on the servers. To be honest, my other programs that are not Rocscience based are slowly dropping off the map.

## Slide v.6.0

*Slide 6.0 will soon be released and will be added to the Rocscience Education Program for this new academic year. As a*



*teaching tool, this software gives the students a simple and easy to use*

*tool to use to experiment with the slope stability principles taught in their courses.*

*Along with the other programs included in the education suite, Slide gives the professor the ability to create challenging problem sets, backed up by 20 tutorials and over 120 verified examples in slope stability and groundwater analysis.*

[Join the Education Program](#)

I am happy to be the first professor to join the Rocscience Education Program. I tell my students that every year; they are very proud of that too.

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