

Volume II Number 4

WIN A FREE SIMIODE T-SHIRT

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WELCOME TO SIMIODE AND OUR NEWSLETTER

SIMIODE - Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations is about teaching differential equations using modeling and technology upfront and throughout the learning process. Learn more at our dynamic website, www.simiode.org

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WHAT ARE YOU WAITING FOR? PUBLISH IN SIMIODE.

If you are reading this then you probably are teaching differential equations of some sort. Moreover, you have probably written and assigned projects. Well, now is the time to publish your materials online in our peer reviewed, double blind referee system.

We quote Willie Nelson in our blog entry of 14 May 2016 [The Wisdom of Willie Nelson](#). He said, "If you can be content right now, then you'll always be content, because it's always right now." Do not just be content that you have done great things for your students. Share that good news and experience with others through publication in SIMIODE.

You can see how to do submit your materials [here](#). What you do is important to your students, but it is also important for your colleagues and their students. Step up and write up your projects for SIMIODE. You will have an online publication at SIMIODE. You will be pleased to know others are using your ideas, building on your success, and enjoying what you enjoy with your students. So, what are you waiting for? Just do it!

Your contribution can be a modest modification of a text problem as we offered in [1-93-S-SucroseReaction](#) or as broad in scope as [4-20-S-AnIEDBlast](#)

One of the main purposes of SIMIODE is to offer colleagues solid, refereed teaching material on which they can base a modeling first course in differential equations. Thus publishing new ideas and activities for students is a main goal of SIMIODE.

However, it is reasonable to ask yourself, "Why should I prepare, submit, and publish in SIMIODE?" [Here](#) we give you many good reasons to publish in SIMIODE. Check them out and see that many fit you. Then join us by sending us your efforts.

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MODELING SCENARIOS YOU MIGHT CONSIDER USING IN YOUR TEACHING

We publish more and more Modeling Scenarios all the time after they have worked their way through the referee and editorial process and are now available. Here are a few which might interest you.

Students build a model of the three trophic level ecosystem of acorns, rodents, and snakes in a forest in [6-21-S-AcornsRodentsSnakes](#). Learn about acorn masting and have your students play "what if games" with changing parameters.

Corban Harwood of George Fox University in Newberg OR presents a modeling opportunity of algae growth in a Mexican lake in [6-20-S-AlgaePopulationSelf-Replenishment](#). Learn about the FREE App PPLANE which permits quality qualitative analyses and plots for students to get feedback on their differential equations models.

Eric Sullivan and Kelly Cline of Carroll College, Helena MT in Modeling Scenario [3-60-S-DataToDifferentialEquation](#) pose a challenging problem. Suppose you know the TOTAL distance traversed by a mass in a spring mass system. Can you recover a differential equation model with correct parameters to model the phenomenon?

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REGISTERING IN SIMIODE

If you have not registered in SIMIODE please go to our [Home Page](#) and do so to benefit from the rich resources in the SIMIODE community.

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SIMIODE MINICOURSE AT MATHFEST 2016 - STILL OPENINGS

TITLE: Teaching Modeling First Differential Equations - Building Community in SIMIODE.

TIME and LOCATION:

Part 1: Thursday, August 4, 3:30 PM – 5:30 PM, Taft D

Part 2: Saturday, August 6, 1:00 PM – 3:00 PM, Taft D

DESCRIPTION: This minicourse permits participants to experience SIMIODE - Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations, an online (www.simiode.org) community of teachers and learners of differential equations who use modeling and technology throughout the learning process. Participants do modeling scenarios from the student perspective, discuss pedagogical and content issues that might arise in such teaching, and initiate the development of their own modeling scenario contributions to SIMIODE through partnering with other participants during and after the minicourse. The minicourse is appropriate for all interested in teaching differential equations in a modeling first approach.

LEADERS: Therese Shelton, Southwestern University and Brian Winkel, SIMIODE

Our leadership team will be joined by Rosemary Farley and Patrice Tiffany, Manhattan College.

Complete details and registration information is available at the [MAA MathFest 2016 web site](#). Consider joining us.

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LOOKING AHEAD TO SIMIODE MINICOURSE AT JMM 2017 IN ATLANTA GA USA

The title of the minicourse is, "Teaching Modeling-First Differential Equations - Technology and Complete End Game Efforts." The team leading this effort will be Rosemary Farley, Manhattan College; Therese Shelton, Southwestern College; Patrice Tiffany, Manhattan College; Jon Paynter, US Military Academy; and Brian Winkel, SIMIODE.

We will offer experiences for building and teaching mathematical models with differential equations: epidemic model of school infirmary, Torricelli's Law, fishery management effort, post-operative retinal fluid dissipation, fair stadium design, sublimation of carbon dioxide, chemical kinetics, ant tunnel building, spread of oil slick, pursuit efforts, pharmacokinetics of LSD and paracetamol, shuttlecock fall, and lake algae. We will discuss the role technology plays in the end game modeling efforts of parameter estimation, non-linear regression analysis, and model comparison. Through hands-on small group learning, faculty will experience the use of modeling and technology to teach differential equations. We, of course, plan to use SIMIODE - Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations, an online (www.simiode.org) community of teachers.

Look for more details in Fall 2016 in MAA literature and website.

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FREE ONLINE DIFFERENTIAL EQUATIONS TEXTS

In our [General Resource Material](#) we offer annotated listings of FREE online differential equations texts. Colleagues have shared their materials in complete text form, often with traditional course structure, as well as rich sets of resources from which to teach. Most texts offered cover the basics of technique and offer exercises. Some also offer modeling applications. Your students will appreciate a FREE text and you might enjoy the fresh approaches taken in such presentations. Try it. At least look at [what is available](#).

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SIMIODE CHANNEL AT YOUTUBE

SIMIODE has a channel at YouTube [SIMIODE YouTube Channel](#). In addition to an [introductory overview](#), a video of what SIMIODE is and can be, there are several videos related to Torricelli's law in which students can collect their own data from a real physical event, model the phenomenon, estimate parameters, and confirm their analysis with comparisons of plots of final model and data. One video is for a right circular column of water in which the water is draining from the cylinder while a digital clock offers time to the thousandth of a second in the background and the height can be seen to the nearest millimeter. Here is an example at [Falling Column of Water in Cylinder](#). Another is of right circular cone of water in which the water is [draining from the cone](#) while a digital clock offers time to the thousandth of a second in the background and the height can be seen to the nearest millimeter.

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STREAMING OF VIDEOS IN SIMIODE

In the current version of the HUBZero platform for SIMIODE we can now stream all videos offered by colleagues who post them. This means individuals who cannot gain access to YouTube can get access to our videos directly at www.simiode.org. Moreover, now videos will be positioned at the appropriate place in support of the material offered. Here is an example [Cannister Falling in Water](#) associated with the modeling scenario [3-70-S-FallingInWater](#). These videos have been effective substitutes for real lab data acquisitions, indeed, they are

videos of real lab data acquisitions. We will continue to also post videos on our [SIMIODE YouTube Channel](#).

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SOURCES FOR YOUR OWN MODELING SCENARIOS

SIMIODE offers [potential modeling scenario ideas](#). These are materials, thoughts, pointers, summaries, articles, etc. to encourage and support your modeling scenario ideas. Consider these ideas and use them to design your own modeling scenarios for your students and then [publish this material in SIMIODE](#). You must be registered and signed in to view these resources.

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WORDS OF ENCOURAGEMENT FROM THE DIRECTOR

SIMIODE is a community which is alive, vibrant, and rich in resources and individual talents to assist colleagues who wish to teach differential equations using modeling to motivate students.

There are a number of ways you can add to the community:

Contribute materials -- You can do this at [Resources: New](#). There you will find types of materials and instructions on how to contribute and begin the process leading to publication in SIMIODE.

Register to referee and review submitted materials. -- Good scholarship merits attention and our double-blind, peer-referee system affords quality reviews of submitted materials. Please, visit our [Manuscript Management system](#) and register as a referee.

Post slides from your presentations or talks. -- When you give a talk locally or beyond you can post your slides, details of the talk or meeting, and comments at [Resources: Presentations](#). Now that you have spread the word beyond the SIMIODE community bring it back home for your fellow SIMIODE members to see.

As always please let us hear from you with your concerns, your news, and your activities. Contact us at Director@simiode.org.

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