SCUDEM II 2018

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Overview:

We offer an invitation for nationwide (and more) April 2018 SCUDEM at local schools around the country (and beyond!) with Competition Saturday, 21 April 2018, for schools within a two hour drive of the local sites. We shall be posting site locations as the number grows. Contact us at Director@SIMIODE.org if you are interested in having a three member student team compete or hosting SCUDEM at your school. We will be opening registration for this broader competition on 1 February 2018.

The high school and undergraduate student team (3 students per team) competition takes place over a week-long period that begins on at each team's individual home campus and culminates on Saturday, 21 April 2018, at a regional host site. Beginning on Friday, 13 April 2018, three member student teams can access three modeling scenarios involving differential equations, posted at our SIMIODE website. They select one on which to work. These teams will work at their home institution, developing approaches and solutions to their chosen modeling scenario. The scenarios are designed so that every team may experience success in modeling, building their skills and confidence in differential equations. Each team will prepare a draft Executive Summary and 10 minute Presentation to bring to the regional host site on Competition Saturday, 21 April 2018. There, student teams will work on a small modification of the modeling scenario they have selected (for example, effects of new assumptions, variables or changes in parameters) for inclusion in their final submissions.

In the morning faculty will participate in faculty development experiences to help them incorporate more modeling in their coursework. SIMIODE has faculty development materials available and will work with local campus coordinators to tailor the workshops. Student teams will address the expansion to their problem, refine their Executive Summary and practice their Presentation, adding any additional details needed.

Teams will submit their Executive Summary at registration/check-in without addressing the additional issues while at noon local site time student teams will submit their electronic Presentation which addresses the additional issue to competition monitors for judging efforts.

During the afternoon session, each team, in one of two tracks of six teams, will give a 10 minute Presentation, scored by an audience of coaches, faculty, and participating students. The competition culminates with an awards ceremony rounding out the day by 4:30 PM to allow time to travel home.

There is a $200 registration fee for each coach-team pair, for faculty development workshop and team participation. Additional teams from the same school, with each team having its own coach, may also register for $200 for each additional coach-team pair. Registration fees are paid through SIMIODE's PayPal portal which will be open from 1 February - 7 April 2018.

Additional faculty, who are not coaching a team, may join workshop and judging activities at no cost. Membership in SIMIODE is FREE.

Helpful Comments from SCUDEM 2017 Problem Author

We have posted Commentary and Overview on the Problems for SCUDEM I 2017 problems from the problem author, Dr. Kelly Black, of the Department of Mathematics, University of Georgia, Athens GA USA. This is a very worthwhile read, highlighting good practices in modeling and communicating results.

Assumptions/Rules:

An Executive Summary is typically a Summary of the results which is forwarded to an Executive for a decision. It might well be named Essential Summary, for it should have the essentials of the activity described, with attention to terms, definitions, assumptions, details, results or conclusions, and reflection, but NOT be laden with computations or reference material. Specific details with respect to format, content, and style will be issued to all student competitors after registration closes on 7 April 2018.

1. This competition is for three member teams of students at the high school or undergraduate level.
2. Registration begins 1 February 2018 and closes 7 April 2018. Team member names are due 7 April 2018.
3. Competition begins Midnight EST Friday, 13 April 2018, with posting of three problems for selection by teams, and closes with submission of Presentations on Saturday, 21 April 2018, at noon local site time.
4. Teams register 12 weeks before the competition with team members registering for SIMIODE and SCUDEM and filling out a pre-event survey. Also coaches register at SIMIODE and SCUDEM and fill out pre-event survey.
5. At Midnight EST Friday, 13 April 2018, teams can access and select the one problem on which they wish to work. Problems will be from 3 different areas: physics/engineering, biology/chemistry, and social sciences/humanities.
6. During the period, Friday, 13 April 2018, through Saturday, 21 April 2018, teams work on their problem at their home institution, producing a two page Executive Summary and a 10 minute Presentation to bring (electronically/physically) to local site.
7. ***NO animate assistance to the team is permitted on the problem effort.***
8. On Competition Saturday morning the following break outs will occur from 9 AM to 11:30 AM at local site
    - Faculty meet for judging Executive Summaries and faculty development activities on using modeling in teaching.
    - Student teams go to separate rooms to address an additional issue posed for each problem and incorporate the results of their efforts in their Presentation. Students DO NOT redo their model.

Teams submit 10 paper copies of their anonymous Executive Summary at registration without

addressing the additional issue offered while, at noon local site time, student teams submit their electronic Presentation which addresses the additional issue to competition monitors for judging efforts.

Role of the Coach

The role of the Coach for each team is to prepare the team members for participation in SCUDEM II 2018, and NOT to assist in any way with modeling efforts during the period of the competition 13 April – 21 April 2018. Indeed, both coaches and team members will be asked to sign an Integrity Statement at Registration on the morning of Competition Saturday, 21 April 2018, which reads, “I, the undersigned, hereby state that during the competition period, 13 April – 21 April 2018, I have not received any animate assistance with regard to the SCUDEM problems as a student competitor. Neither have I given any assistance to any member of a team as a coach.”

Specifically, before 13 April 2017, but not during the competition 13 April – 21 April 2018, a coach can organize the team; meet with team members to discuss technical materials; go over past SCUDEM modeling problems and student submissions; go over with team members the comments from the problem poser from SCUDEM I 2017 on what good modeling should be; help students develop good presentation skills and concise writing and communication efforts; and go over the requirements for SCUDEM II 2018. The coach should make sure students understand what is expected of them in terms of deliverables: (1) a two page Executive Summary and (2) a 10 minute Presentation, both to be delivered on Competition Saturday, 21 April 2018.

One thing the coach should do before the competition begins is to stress the need for the team to settle on one of the three problems offered (and not carry forth with several problems’ analyses) in the first day or so and move on to success with their model building on that one selected problem. Further, coaches should stress that there is no one right answer, but rather SCUDEM is about demonstrating the modeling process as applied to the problem of their choice. thus formulating and communicating their efforts is of utmost importance.

Coaches need to emphasize that ALL team members must participate in all aspects of SCUDEM, modeling, writing, and presentation.

Certainly, coaches may interact with their team members during the competition period, but under no circumstances should there be technical discussions about their modeling efforts on their problem of choice. This is THEIR chance to develop and grow. Coaches should let students bloom.

Competition Saturday 8:30 AM – 4:30 PM (Local time)

Judging, Fellowship, Awards

8:30 AM	Teams arrive at local site. Debriefing,

	confirmation/registration, tour of facilities. Ten copis of paper version of two page Executive Summary submitted,
9:00 AM	• Faculty meet to judge Executive Summaries and for Faculty Development I to engage in modeling activities in differential equations and other courses. • Student teams go to separate rooms to address an additional issue posed for each problem and incorporate the results of this efforts in their Presentation.
11:30 AM	Presentation submitted electronically by noon. All break for lunch. All pay for their own lunch in institution dining area.
1:00 PM	Faculty and students return to designated rooms. Faculty Development II in which faculty share modeling experiences and discussions on modeling in differential equations coursework, while students compete in fun Math Bowl for individaul awards.
2:00 PM	Teams make Presentations— tracks of 4 Presentations each —10 minutes each, 5 minutes for questions, and 5 minute break between Presentations for scoring by fellow students and faculty. (Total 2 hours.)
4:15 PM	(15 minute) Award presentations for Outstanding, Meritorious, and Successful team modeling and first, second, and third place for individual MathBowl competition with departure at 4:30 PM.

Objectives:

1. Offer students modeling opportunities in one area of mathematics, differential equations, to practice modeling skills and permit focus on modeling approach and mathematics.
2. Foster the value and applicability of differential equations.
3. Develop visual and verbal communication skills through written Executive Summary and oral Presentation.
4. Bring faculty coaches together for Faculty Development to experience modeling activities and share ideas and activities from their own teaching in modeling with differential equations and other courses.
5. Get students to think about value in teaching with modeling and invite exceptional student efforts to submit a full write-up for peer-reviewed Modeling Scenario publication in SIMIODE.

SCUDEM Offerings:

- Create a supportive and competitive environment for modeling at host sites (for schools within a 2 hour drive) that builds camaraderie for students through team work.
- Give students feedback on their work through seeing other group presentations, receiving feedback from on-site judges, and receiving final awards.
- Offer faculty development activities for modeling in teaching.
- Recognize creative skills and communication of students.
- Have an enjoyable experience for faculty and students.
- Period of time is given to invited teams with exceptional results to write-up their materials as publication-quality Modeling Scenarios, ready for SIMIODE referees.

Benefits for school, students, and faculty

School:

For each school there is the fact that a team has represented the school on the fields of friendly strife, received an award certificate for work on a model in response to a real-world situation, and the possibility of publishing their results. Most importantly, there is individual and school recognition as well as participation and dialogue with peers.

Students:

For students there is the camaraderie of the three person team and the opportunity to meet with other students from other schools who are passionate about applying mathematics and share the same SCUDEM experience. For students of mathematics to be honored as a team effort is very motivating and students who compete in the COMAP MCM/ICM say, unequivocally that the time spent was the best undergraduate mathematics experience they have had. While on a different scale, SCUDEM generates a comparable response. There is an award certificate for their work on a model in response to a real-world situation and the possibility of on-line publication as a Modeling Scenario in SIMIODE.

Faculty:

Faculty make contacts with others who are interested in modeling in their coursework, contacts which can function and last as they are made at the regional level. Faculty can come away from discussions held at the competition site refreshed with new ideas from other faculty, proud of what their students can accomplish, and in touch with new found professional friendships.