



Student Challenge Using Differential Equations Modeling

SUMMARY REPORT for SCUDEM VIII 2023

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Overview and Problems Offered

SIMIODE VIII 2023 is an international student team challenge in which teams of three students from high schools and undergraduate programs select one of three problems and produce a mathematical model using differential equations. They then prepare a ten-minute video and post it Unlisted in YouTube for judges to view and then score and render constructive comments.

The three problems for SCUDEM VIII 2023 can be found here:

https://www.contest.comap.com/scudem/2023_Problems/SCUDEM_VIII_2023_Problems.pdf

These three problems are in the general area of (A); Chemistry/Life Sciences; (B) Physics/Engineering; and (C) Social Sciences/Humanities. We give the title of each problem.

- Problem A: Kangaroo Care
- Problem B: Punishing Infants
- Problem C: Dog Cannot Catch

Problems were released on 20 October 2023 and team videos were due and posted on 13 November 2023 while judging was completed by 16 December 2023.

Judges were asked to use a Scoring Rubric found at this website

https://www.contest.comap.com/scudem/flyers/SCUDEM_Scoring_Rubric.pdf to add constructive comments for each team.

Summary Statistics

424 students participated, forming **158** three student (or less) teams, with **57** coaches. In some cases coaches worked with multiple teams. Or several teams did not have coaches. **124** teams submitted a final ten-minute video for judging.

285 volunteer faculty and industry personnel served as judges. The judges rendered **910** team scores and constructive comments. This gave each team, on average, **7.33** judge scores and comments for a great deal of feedback through which students will grow with respect to their modeling abilities.

Some schools submitted over 15 teams while others fielded 1 team.

Recent SCUDEM events have had students, coaches, and judges engage from the following countries and regions: Albania, Algeria, Australia, Azerbaijan, Bangladesh, Belgium, Benin, Bolivia, Bosnia and Herzegovina, Brazil, Canada, Chile, China, Columbia, Egypt, France, Germany, Ghana, Hungary, India, Indonesia, Iran, Ireland, Italy, Japan, Jordan, Kenya, Kuwait, Macao, Malaysia, Mauritius, Mexico, Morocco, Nepal, Netherlands, New Guinea, Nigeria, Norway, Oman, Pakistan, Philippines, Poland, Portugal, Romania, Russia, Saudi Arabia, South Africa, Spain, Sri Lanka, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Viet Nam, Zimbabwe.

Awards Information for SCUDEM VIII 2023

Overall the following awards, with numbers of teams and percentage of each level were:

Award Level	Number	Percent
Outstanding	38	30%
Meritorious	69	56%
<u>Successful</u>	<u>17</u>	<u>14%</u>
Totals	124	100%

The breakouts of problem selection and awards for each problem were:

Problem A Summary **30** Submissions

Outstanding	11
Meritorious	13
Successful	6

Problem B Summary **39** Submissions

Outstanding	9
Meritorious	26
Successful	4

Problem C Summary **55** Submissions

Outstanding	18
Meritorious	30
Successful	7

Announcement of Awards

SIMIODE publicly announces only the Outstanding Team Awards and will formally invite these teams to post their team video at the [SIMIODE's YouTube Channel](#). SCUDEM VIII 2023's 37 Outstanding Team Award videos will be posted there in January 2024.

All teams will receive a Press Release form for use in getting out the word of their engagement.

SCUDEM VI 2022's 27 Outstanding Team Award videos are available at [SIMIODE's YouTube Channel](#) along with the Outstanding Team Award videos from previous SCUDEM events.

All teams and their coaches are provided with award information (Outstanding, Meritorious, and Successful), including all judges scores, average score, and complete set of judges' comments, as well as certificates for awards and participation. All coaches and judges are given certificates of appreciation.

We thank all for making SCUDEM VIII 2023 a successful and meaningful event for students.