



Student Challenge Using Differential Equations Modeling

SUMMARY REPORT for SCUDEM VII 2022
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Overview and Problems Offered

SIMIODE VII 2022 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 score and render constructive comments.

The three problems for SCUDEM VI 2022 can be found here:

https://www.contest.comap.com/scudem/2022_Problems/SCUDEM_VII_2022_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: Introducing Stress
- Problem B: The Mechanics of Suction Feeding
- Problem C: People Ruin Everything

Problems were released on 23 October 2022 and team videos were due and posted on 14 November 2022 while judging was completed by 11 December 2022.

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

366 students participated, forming 142 three student (or less) teams, with 56 coaches. In some cases coaches worked with multiple teams. Or several teams did not have coaches. 109 teams submitted a final ten-minute video for judging.

296 volunteer faculty and industry personnel served as judges. The judges rendered 870 team scores and constructive comments. This gave each team, on average, 8 judge scores and comments for a great deal of feedback through which students will grow with respect to their modeling abilities.

Students, coaches, and judges engaged from the following countries and regions: Albania, Algeria, Australia, Bangladesh, Bosnia and Herzegovina, Brazil, Canada, Chile, China, Egypt, France, Germany, Ghana, Hungary, India, Indonesia, Iran, Ireland, Italy, Japan, Macao, Malaysia, Mauritius, Mexico, Nepal, New Guinea, Nigeria, Norway, Oman, Pakistan, Philippines, Portugal, Russia, Saudi Arabia, South Africa, Spain, Sri Lanka, Taiwan, Thailand, Netherlands, Ukraine, United Arab Emirates, United Kingdom, United States, Viet Nam, Zimbabwe.

Awards

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

Award Level	Number	Percent
Outstanding	27	25%
Meritorius	56	51%
Successful	26	24%
Totals	109	100%

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

Problem A Summary	31 Submissions
Outstanding	6
Meritorius	20
Successful	5

Problem B Summary	20 Submissions
Outstanding	3
Meritorius	10
Successful	7

Problem C Summary	58 Submissions
Outstanding	18
Meritorius	26
Successful	14

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 VII 2022's 27 Outstanding Team Award videos will be posted there in January 2023.

SCUDEM VI 2021's 26 Outstanding Team Award videos are available at [SIMIODE's YouTube Channel](#) along with the Outstanding Team Award videos from SIMIODE V 2020.

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 VII 2022 a successful and meaningful event for students.