



Student Challenge Using Differential Equations Modeling

## SCUDEM Scoring Rubric

### Overview:

Team Presentation will be scored holistically on a 5-point scale: 1 (poor work) to 5 (excellent work). The score will consider three aspects: execution, communication, and correctness. To earn a 5, work must be *well-executed*, *well-communicated*, and *essentially correct*.

The online YouTube 10-minute Presentations will be scored by invited judges. Video web addresses will be provided by COMAP to all judges. Judges will provide a score and comments to each team.

### Definitions:

#### Well-Executed

- Applies a **strategy** that makes sense for the given question
- Applies appropriate mathematical concepts and processes
- Does not offer superfluous material
- Technology is used appropriately
- Work is logical and includes a reality check of the final answer

#### Well Communicated

- **Readable:** Work *stands alone* (retains context) and is neat and professional
- **Organized:** Provides a *clear logical* flow
- Provides detail, rationale, explanation
- Work is free from grammatical errors
- Mathematical composition, terminology, and notation is correct
- Results and/or conclusions are clear

#### Essentially Correct

- **Precision:** Performs mathematical operations correctly
- Makes and uses assumptions clearly
- Uses an appropriate degree of accuracy
- Draws correct inferences from graphical or numerical data
- Any computational or algebraic errors are trivial and isolated
- Correct units are used

### Score Descriptors:

| 5                                                                                  | 4                                                                                                           | 3                                                                                                                               | 2                                                                                                                       | 1                                                                                                                              |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Excellent                                                                          | Very Good                                                                                                   | Good                                                                                                                            | Fair                                                                                                                    | Poor                                                                                                                           |
| Well-executed, well-communicated, essentially correct. Offers reflection on model. | Generally well-executed but may have minor communication flaws or some errors. Describes model development. | Adequately executed but with some non-trivial errors or inconsistent communication. Conveys basic idea and rationale for model. | Flawed execution possibly with non-trivial errors or poor communication. Model presentation not clear or conveyed well. | Unsatisfactory execution and/or communication with fundamental errors. Lack of clarity in defining terms and explaining model. |

### Final Awards:

Presentation scores will be averaged from all judges and tabulated scores ranked high to low. Awards will be determined for teams as follows: Outstanding Winner, Meritorious, Successful Participant. All teams are expected to complete and defend a model involving differential equations and thus merit some award. Comments from judges will be distributed to student teams and coaches along with award certificates via electronic means after all judges' data have been received.

Each team and coach are notified of their award and will receive certificates and judges' comments. SCUDEM is not about competition, but rather about individual and team challenge and growth. Outstanding award teams' videos will be published on COMAP's YouTube Channel.