SME & NSSGA
Student Design Competition

2025-2026 COMPETITION INFORMATION AND RULES

2024-2025 First Place Winners
Black Gold Consulting
University of Kentucky

smenet.org

Contents

1 Student Design Competition Basic Information

1.1 Introduction

The Student Design Competition was introduced in the fall of 2004 and culminated at the 2005 SME Annual Meeting and Exhibit in Salt Lake City, UT. It is a two-Phase competition involving a technical design Phase and an oral presentation Phase based on an aggregate mining industry design problem. It was felt that combining these two categories provided the basis for most engineering work students will encounter in the mining industry. In this way the students can be involved in a "real world" engineering problem and solution prior to graduation. Teams are judged on presentation skills, creativity, understanding of aggregate mining processes, and thoughtful methodology.

1.2 Competition Overview

Students majoring in mining and mineral engineering, civil engineering, geology, business, or any other field related to the aggregate mining industry may compete. The competition can serve as one of the activities for SME and NSSGA student chapters but will not be limited to those universities sponsoring student chapters. Any university capable of fielding a team of six undergraduate students is welcome to compete.

The competition is comprised of two Phases. The purpose of the first Phase is to simulate an engineering solution prepared for the chief engineer of a company. This phase is an on-campus, "set time limit" competition during the fall semester in which students will prepare a written report addressing a mine design problem statement. A faculty advisor, or team coach, will closely monitor each team for rule enforcement and time worked. Judges selected from the industry will evaluate the written solutions, which will make up 40% of the final score. The top six teams from this phase will advance to Phase 2; however, the Student Design Competition (SDC) Committee reserves the right to adjust this number prior to announcement of the preliminary round results.

During the second Phase, held at the SME Annual Conference and Expo, each team will receive a modified problem statement which builds upon the Phase 1 problem statement. The purpose of this Phase is to simulate a presentation to company leadership. Instead of submitting a written report, teams will prepare an oral presentation to a panel of judges describing their solution. The judging panel will question the teams on their solution and offer feedback on the design. The score from the second Phase will reflect 60% of the final score. The top three high scoring teams (combined Phase 1 and Phase 2 scores) will receive awards for first, second, and third place.

1.3 Competition Timeframe

The Student Design Competition is scheduled as follows:

Phase 1 Begins	Monday, September 15, 2025
Last Day to Submit Phase 1 Problem Solutions to SDC Committee	Wednesday, November 26, 2025
Results of Phase 1 Presented to Teams	Early January, 2026
Phase 2 Begins	Friday, February 20, 2026
Phase 2 Presentations and Awards	Sunday, February 22, 2026
2026 SME Annual Conference and Expo	Begins Sunday, February 22, 2026

1.4 Team Registration

Teams will register for the competition through the through "Submit Team Information" button on the Student Design Competition page of the SME website, *https://www.smenet.org/professional-development/awards-competitions/student-design-competition* . If there are any issues with the registration process, please contact both Daniel Sadtler (sadtler.daniel@gmail.com) and Tyler Faulkner (tfaulkner@carlsonsw.com). Please allow at least 3 business days between submittal of the registration and the Phase 1 start date.

1.5 Statement of Confidentiality and Honor

When registering your team online you will be asked to check a box indicating your agreement with the following statement of Confidentiality and Honor. You will not be able to register for the competition without agreeing to these terms.

On my honor, I agree to act with integrity during the Student Design Competition. I agree to follow all competition rules. I will not discuss the competition outside of the design team or outside the hours of the competition. I will not seek any outside opinions or assistance during this competition from anyone, including professors, peers, friends, family, or aggregate/mining professionals. I will not share any information given in the Problem with persons unaffiliated with the SME/NSSGA Student Design Competition at any time. I have also read and understand the rules surrounding this competition. I understand that violating these rules can lead to deduction of points or disqualification.

1.6 Benefits of Participating in the Student Design Competition

The real-world nature of this competition aims to better prepare students for their careers following graduation. Students may be faced with problems that have not yet been encountered in the classroom or internships/co-ops, but this highlights the importance of being able to adapt to new challenges.

The competition also provides networking opportunities for students within your own university and across the mining industry as a whole. Connecting with your peers can prove invaluable, and students are therefore encouraged to take full advantage of this. Don't be afraid to introduce yourself to the other teams, the committee members, the judges, and the competition sponsors!

One of the major benefits of participating in the SME/NSSGA Student Design Competition is being able to show yourself off to a large list of corporate sponsors. One of the reasons corporations sponsor the event is to have a look at the future of the mining industry: you! The SDC Committee will create a résumé book to distribute to any company that sponsors the event. If you would like your resume to be made available to sponsors, please email a PDF copy to Tyler Faulkner (tfaulkner@carlsonsw.com).

2 General Competition Rules

2.1 School Eligibility

Student teams must be enrolled in undergraduate degree programs related to the aggregate mining industry at a college or university.

2.2 Team Size, Makeup, and Member Eligibility

Each competing team will consist of up to **six undergraduate student members of SME who must remain undergraduate students for the entire competition**. Each team member must be a member of SME in good standing. Contact Mona Vandervoort, Education Coordinator with SME, for assistance with SME membership registration or questions (vandervoort@smenet.com). Students who have been previously awarded an undergraduate degree may still compete as long as:

- The previously awarded degree is not in the mining, mineral, geology, or civil disciplines.
- They are currently enrolled in an aggregate related, undergraduate degree program and will remain enrolled through the entire competition.
- They obtain written permission from the SDC committee.

If a team member must drop out of the competition for any reason, the SDC committee must be notified in writing by the faculty advisor/coach and include the following: school, team name, individual's name, date, replacement member (if wanted) and reason the member is withdrawing from the competition. Another undergraduate student sponsored by the same school may continue in the withdrawn team member's place from that time on provided that SDC is notified in writing of the change. **No more than one replacement per team will be allowed during each Phase of the competition**. The balance of time remaining for the student that is replaced will be the only time allowed for the new team member to work on the problem solution.

2.3 Advisors and Outside Assistance

Each team shall have a faculty advisor/coach that will monitor the team in Phase 1 and will accompany the team to Phase 2 of the competition. Once the competition begins, the advisor's role is limited to ONLY ensuring the competition rules are being followed.

Throughout the competition, **no** direct input from anyone outside the team (phones calls, emails, etc.) shall be allowed after the problem-solving period begins. Use of the Internet as a search tool for additional reference information is allowed. Contacting the SDC committee for clarification or for questions is allowed.

2.4 Competition Problem Statements and Conditions

Each team will be presented with the problem statement. These materials represent the entire problem statement and scope of work. Questions during the competition, if any, may ONLY be directed to the SDC committee, which will determine if there is an appropriate answer.

Each team must strictly adhere to the specific time frames, deadlines, schedules, locations, or conditions set forth in the problem. There shall be no outside contact or assistance from any group, individual, association, contractor, or other outside entity. Failure to follow any of these rules may result in score reduction or even disqualification from the competition.

During Phase 2, no team or team member may enter the problem presentation room or view a presentation until after that team has given its presentation. Competition members will not be allowed to ask questions. **Violation of these rules shall be cause for immediate disqualification from the competition.** If competition members choose to watch subsequent presentations, please respect the team presenting and refrain from discussions among audience members.

2.5 Competition Data and Materials

The competition uses data from actual aggregate mining companies. This is real data and will therefore represent the type of information you will have as a mining engineer in the future. The company that donated the information has hundreds of thousands of dollars invested in the data and is proprietary to that company. Therefore, the data should be respected and not reproduced or used for any other purposes without approval from the SDC committee. **Note that competition data may NOT be used for senior design or capstone projects.**

If students are looking for senior design or capstone project data, please contact Dan Sadtler (Sadtler.daniel@gmail.com) and Tyler Faulkner (tfaulkner@carlsonsw.com). A number of companies from previous competitions have generously allowed the SDC committee to share historic SDC Competition data with students for this purpose.

3 Phase 1

The SME/NSSGA Student Design Competition will be held in two Phases with the preliminary Phase held on the respective team's campus and the final Phase held in conjunction with the SME Annual Conference and Expo. Competing teams are comprised of up to 6 undergraduate student members of SME and 1 faculty advisor.

In Phase 1, the teams work on campus to provide a written solution, in English, to the problem provided by the competition committee (referred to from here on as SDC). The teams have 35 hours per student to work on a solution to the problem with the time worked closely monitored by a faculty advisor/team coach approved by SDC. Each team will have any 21 consecutive day period of their choosing from the time the problem is given to the team to the last date available to work to submit their solution. During that time, the faculty advisor and team can schedule the 35 hours whenever it best fits the students' schedules (as long as it occurs within a consecutive 21-day period). A panel of judges from SME-member companies will judge the solutions submitted. There will be no "extra credit" given for early submissions. Teams may begin the 21-day period as early as Monday, September 15, 2025. The final deadline for submitting the report will be Wednesday, November 26, 2025, unless an extension is permitted in writing by the SDC.

3.1 Problem Solution

The solution submitted during this Phase should be as complete as allowed by the time constraints. Although specific details may not be finalized and designed to a "procurement or construction level", enough design must be conveyed to ensure adequate confidence in the project. Actual design of specific items may be omitted from the solution as long as an adequate description of the item is presented along with an approach for its resolution (e.g. it may be sufficient to give generalized design information, for example, a 3.5 yd^3 loader might be specified without detailing the make or model).

The solution should convey enough information to define the mine design, and it should be more detailed than a simple conceptual design. The presentation of the data should be approached as if the group is handing over the design to the senior engineer at the company.

While there is no limit on the size of the submitted solution, students are advised that longer reports are not always better. Keep in mind that the goal of this competition is to simulate a "real world" engineering problem. Company leadership, as well as the competition judges, are impressed by a well thought out, clearly communicated, and concise solution. All information included in the report should provide support to the problem and not provide filler that is unrelated to your solution.

3.2 Time Limits

Each team may take a total of 35 hours per student to read the problem information, generate a solution, and create an organized report stating conclusions and recommendations. The total of 35 hours can be spread out over a 21 consecutive day time period. A recommended distribution of the 35 hours is as follows:

- 5 hours to read the problem, formulate a plan of attack, and break into subgroups
- 20 hours to work the problem, address design issues, and formulate solutions
- 10 hours to formulate the memo, write detailed descriptions of design solutions, translate (if necessary), and put finishing touches on design package

Once the problem has been distributed to the student team by the on-campus team advisor, the advisor shall initiate the 21-day period. During this time, the team shall work as a group of individuals in an isolated environment, away from all people not involved with the competition. If hours are not being counted toward each person's 35-hour limit, the members cannot work on the project and cannot discuss ideas and sections of the project.

At the end of the 35 hours (cumulative), the solution and completed report/letter will be given to the advisor. The advisor or designated team member must then submit the report to the SDC. *Please submit the solution electronically, in PDF form, through the Student Design Competition page of the SME website, https://www.smenet.org/professional-development/awards-competitions/student-design-competition.* If there are any issues with this submission process, please contact both Daniel Sadtler (sadtler.daniel@gmail.com) and Tyler Faulkner (tfaulkner@carlsonsw.com).

Each individual team member is limited to 35 hours. That is to say, the time may not be distributed among the team members in an amount greater than 35 hours. One person cannot work 50 hours while another person compensates by only working 20 hours to reach an average of 35 hours. The team does not have to meet together for 35 consecutive hours, but each person cannot work more than 35 hours cumulative.

A question regarding this rule was posed at a previous competition and is reprinted below with SDC's answer.

> ***Q:*** *"When the team is not in session the members cannot work on the project and cannot discuss ideas and sections of the project." Does this mean that one or two members of the team cannot work within their individual 35-hour limit on their own on some aspect of the project and bring their results to the full team meeting and does the full team always have to meet together for anything to be done on the project?*
>
> **A:** Team members, individually or in small groups, may work on their assigned portion of the project at any time during the 21-day period in which they are within their 35-hour limit. It is not required that the full team be present at once for any work to be allowed on the project or for the team to be considered "in session". The quote that you mentioned may be better interpreted as: "When any member of the competition team is not charging time against their 35-hour work limit, they cannot work on the project and cannot discuss ideas, sections, or anything related to the project with anyone, including themselves."

For example, if one team member is to work on the mine design, another the processing plant design, and the rest on other portions of the project, they do not have to work together or even at the same time; however, whatever time they do work on the project must be documented and count against their 35 hours and must occur within the 21-day work period. Also, if for example, two team members have an impromptu discussion after a class regarding the project, they may do so as long as they count their time.

3.3 Solution Organization

The design team should allow ample time in the 35 hours to complete a report addressed to the project engineer or board of directors describing their conclusions and recommendations. All solution materials should be submitted to the SDC in electronic format (PDF). The report should include all appropriate references and formulas to support the solution. All backup material/calculations should be included with the submission. The teams should submit their solution in PDF format through the Student Design Competition page of the SME website, *https://www.smenet.org/professional-development/awards-competitions/student-design-competition*. Time is allowed outside of the 35-hour work time for transmitting the PDF.

3.4 Scoring

The student design team will be scored in Phase 1 based on team solution presentation and format, problem solution, and overall project design. The Phase 1 score counts for 40% of the total score for the competition. The breakdown for scoring will be as such:

Area		**Phase 1 Score Contribution**
Report Presentation	Spelling/Grammar	10%
	Neat/Clear/Precise	5%
Problem Solution and Approach	Design Supported by Equations/References	25%
	Correct/Accurate Solution - Feasibility/Simplicity of Design - Reserve Calculation - Mine Plan - Environmental Aspects - Engineering Judgment - Documented Assumptions	45%
	Thought Process Easily Understood	5%
Overall	Uniqueness of Solution and Organization	10%

The judging will be completed and the results of the first Phase will be announced in January 2026. The teams moving onto Phase 2 will be announced in alphabetical order and the numerical scores will not be shared with the other teams. Up to six teams will participate in the final round; however, the SDC committee reserves the right to adjust this number prior to announcement of the preliminary round results. In either case, all teams participating in Phase 1 of the competition should prepare to attend the 2025 SME Annual Conference.

4 Phase 2

Phase 2 will be conducted at the 2026 SME Annual Conference and Expo in Salt Lake City, UT. In this Phase, the teams will be given a problem statement that expands upon the Phase 1 problem statement, along with feedback from the judges on their Phase 1 reports. The teams will then prepare an oral presentation to support their solution to a given problem and present it to the panel of judges who will be acting as the Board of Directors of the operating company. The team should be prepared to answer questions about their design solution to the panel who will have previously reviewed and judged the individual teams' written solutions from the first Phase. The specific problem that the design team will have to solve and present will be given to the teams on Friday afternoon/evening prior to the SME Annual Conference and Expo. They will then have until a pre-determined time on the following Sunday morning to work on their solutions and presentations. Each team will then be given 45 minutes in which they will make their presentations. The order of presentations will be randomly selected.

4.1 Attendance

After the results of Phase 1 are announced in January, each of the top six teams will receive an Attendance Confirmation Form. This form must be completed and returned to the SDC by the date specified in order to confirm your participation in Phase 2. If your team does not submit the form before the deadline, SDC will assume that your team is unable to attend the competition and will open your spot to the next highest-scoring team.

Each team participating in Phase 2 must physically be present during the competition; no team will be allowed to give their presentation via online web meeting or pre-recorded video. Please note that it is strongly suggested that teams stay at hotels within walking distance of their provided Phase 2 workrooms.

Teams attending Phase 2 are required to be student members of SME and must register for the 2026 SME Annual Conference and Expo. Each team participating in Phase 2 will be completely responsible for all travel arrangements, lodging, and conference registration for the SME Annual Conference and Expo. The SDC is not responsible for any of this planning or cost.

4.2 Equipment

A *maximum* of one computer per participant, and one printer, one plotter, and one scanner per team is allowed. All copying, printing, and scanning will be up to the individual teams. Each team should allow ample time to make any desired prints or copies. Delays caused by copy room personnel or equipment **will not** be considered by the judges as an acceptable excuse. If access to the Internet is required, then it will be up to the individual teams to ensure that they have the proper equipment to do so. The SDC will make every effort to ensure access to the internet during Phase 2, and as much notice as possible will be given if internet access cannot be provided. If availability of internet is questionable, the SDC will determine the appropriate alternative.

A presentation computer, projector, podium, and microphone will be supplied by the SDC for team presentations. The teams should be prepared with their own computer as a backup. Internet access for the presentations is not guaranteed. Furthermore, any additional equipment required for a presentation should be coordinated through the competition coordinator. Please note that there may be additional charges for internet access or additional presentation room resources. Any charges must be paid in advance by the requesting team.

4.3 Room Setup

The SDC committee will furnish a work room for each team with enough tables and chairs for each member of the team. Additional work tables and chairs can be rented at the Hotel for use during the competition. Table rental fees, with security deposits, must be paid in advance. Whatever equipment and publications are brought to the work rooms are the responsibility of the individual team. Furniture cannot be removed from the work rooms.

4.4 Preparation Time

Each team will have from the time the problem is distributed on Friday afternoon until the team's presentation time on Sunday morning to work on their solution/presentation. The presentations will begin Sunday morning (exact schedule will be determined closer to the presentation time). The team will be expected to prepare for the presentation in their work room. The advisor and SDC personnel will supervise this Phase.

4.5 Presentation

Each team should be prepared to give a 20-25 minute presentation with a 20-25 minute question and answer period immediately following the presentation (total presentation and question time shall not exceed 45 minutes). The teams can give their presentations in any media they desire, whether by MS PowerPoint, MS Word, hard copies, etc., as long as the presentation can be projected onto a screen for the audience to see. All team members should be active in the presentation process, with no less than half the team talking during the main presentation (if there is an odd number of people in a team, round up).

The SDC will record the presentations unless a team indicates that they do not wish to be recorded. These recordings will be made available to the other teams and the public after the conclusion of the competition.

4.6 Attire

The design team should wear at least business casual clothing during the presentation.

4.7 Scoring

The student design team will be scored in Phase 2 based on Presentation, Solution, and Question/Answer Session. The Phase 2 score counts for 60% of the total score for the competition. The breakdown for Phase 2 scoring will be as follows:

Area	Phase 2 Score Contribution
Visuals/Displays	10%
Speaking Skills	10%
Team Member Participation	10%
Quality of Presentation	20%
Technical Solution	30%
Question/Answer Session	20%

4.8 Awards

The final score will be determined by a 40/60 combination of the Phase 1 and Phase 2 scores, respectively. Up to six teams will compete in Phase 2; however, the SDC committee reserves the right to adjust this number as events develop.

Cash prizes will be awarded for the top three teams as follows:

First Place	$3,000 and Plaque for School
Second Place	$2,500 and Plaque for School
Third Place	$2,000 and Plaque for School

Please note that the cash prizes may change as the competition budget is finalized.

Additionally, each member of the winning team will be awarded a one free online course of their choice from Edumine.com.

5 Questions

5.1 Phase 1

Phase 1 questions shall be emailed to both Daniel Sadtler (sadtler.daniel@gmail.com) and Tyler Faulkner (tfaulkner@carlsonsw.com). Questions must be sent to both contacts above to ensure a prompt response. An effort will be made to answer the questions in a timely manner; however, as all the teams will be working the problem on different schedules than the SDC committee, it may take up to 48 hours for a response. Neither the 21-day working period nor 35-hour time limit will be extended due to delays in the SDC committee responding to questions

5.2 Phase 2

During the second Phase of the competition the SDC committee will be available during normal business hours to answer questions. The committee may decline to answer individual questions during this Phase of the competition. If the committee does provide an answer, it will not be communicated to the other teams. However, if a team finds an error in the problem or data provided, this information will be communicated to all teams.

One of the aspects of being an engineer is the ability to make supported assumptions; the teams are encouraged to do this. As in practice, not all information is provided in detail and requires assumptions to be qualified, and some extraneous detail may be needed. However, all assumptions should be clearly stated and supported.