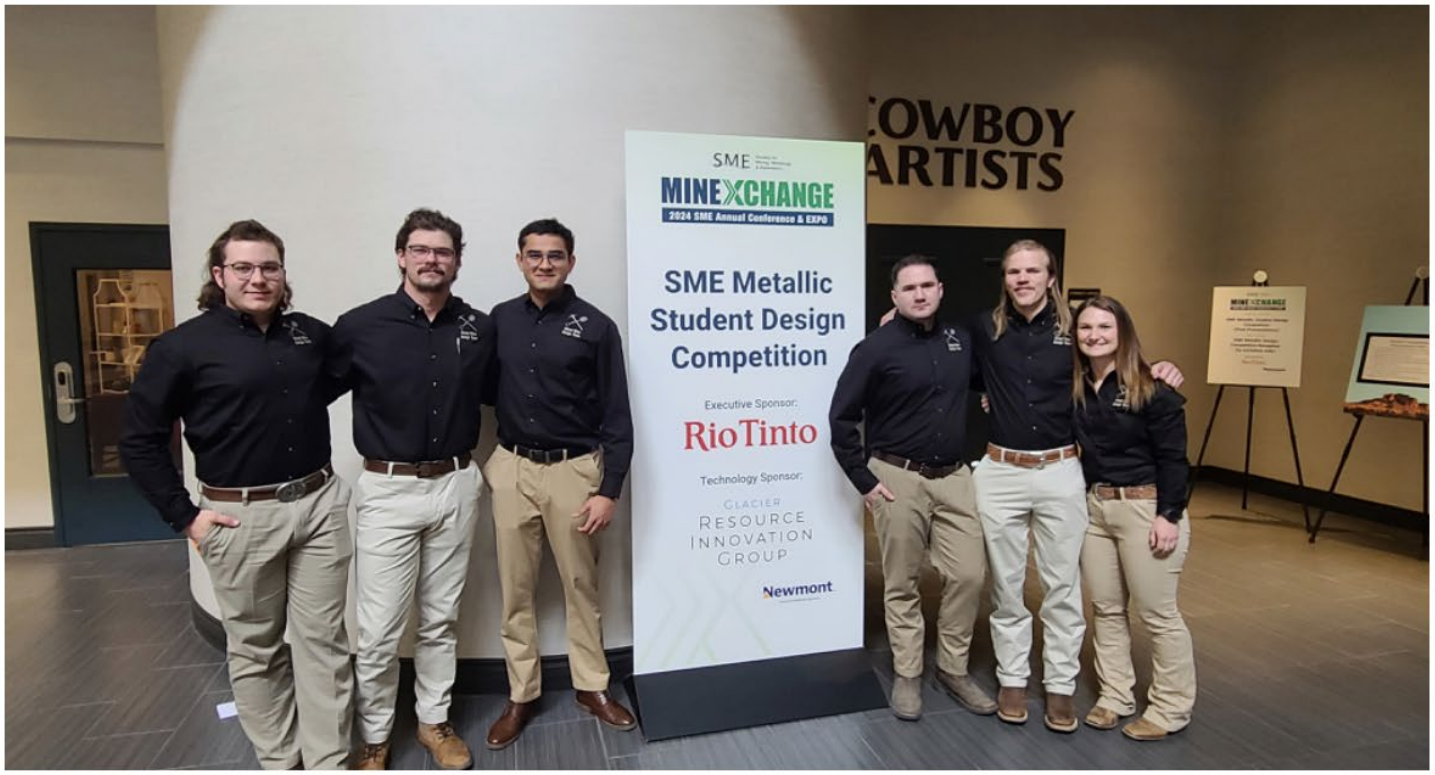
2025-2026

SME
Society for Mining, Metallurgy & Exploration

METALLIC STUDENT DESIGN COMPETITION



COMPETITION INFORMATION AND RULES

Competition sponsored by:

RioTinto

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1 Student Design Competition Basic Information

1.1 Introduction

The SME Student Design Competition – Metallic was introduced in the fall of 2020 and culminated at the 2021 SME Annual Conference& Expo in Denver, Colorado. The Metallic Student Design Competition (SDC) is a hard rock competition focused on the evaluation of a mineral deposit (precious or base metal, or industrial minerals) and development of a potential flowsheet and process design. The competition is conducted in two stages, with the second stage and final judging taking place at the SME annual conference.

1.2 Basics of Competition

Students majoring in mining-related engineering fields (mining, metallurgical, mineral processing, geological, chemical), science, business, or other fields related to the Metallurgical and Mineral Processing industry may compete. The competition can serve as one of the activities for SME student chapters but will not be limited to those Universities sponsoring student chapters. Any University capable of fielding a team of six undergraduate SME students is welcome to compete.

The competition will take place in two Stages. The first Stage is an on-campus, "set time limit" competition during the fall semester. A faculty advisor, or team coach, will closely monitor each team for rule enforcement and time worked. The purpose of the first Stage is to simulate an engineering solution prepared for the chief engineer of a company. Judges selected from the industry will evaluate the written solutions, which will make up 40% of the final score.

During the second Stage, to be held at the SME Annual Conference and Expo, each team will receive the competition problem at the same time from which to prepare an oral presentation for a panel of judges describing their solution. The judging panel will be given the opportunity to question the team on their solution. The purpose of the second Stage is to simulate a presentation to company leadership. The score from the second Stage will reflect 60% of the final score. The top three highest scoring teams (combined Stage 1 and Stage 2 scores) will receive awards for first, second, and third place.

1.3 Stage 1

The first Stage will take place at individual Universities, under the guidance of the faculty advisor/team coach. This Stage may be completed by each team during any 28-day period between Monday, September 22, 2025, and Sunday November 23, 2025. A panel of judges, drawn from industry, will review the submissions for completeness. The judging will be completed and the results of the first Stage announced in December 2025. The teams moving onto Stage 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.

All teams participating in Stage 1 of the competition should prepare to attend the 2026 SME Annual Conference and Expo in Salt Lake City, UT for the second and final Stage if they are invited. Teams that are prohibited from travel will ***not be*** considered for Stage 2 participation.

1.4 Stage 2

The second Stage will be held at the 2026 SME Annual Conference and Expo in Salt Lake City, UT. The competing teams will be given a problem expanding upon the Stage 1 problem. The teams will have a set amount of time to evaluate the problem, formulate a solution, provide alternative solutions, and prepare an oral presentation of their design. This evaluation will be given orally to the group of judges. The Stage 2 score will then be combined with the Stage 1 score to select the first, second, and third place finishers.

2 General Competition Rules

2.1 School Eligibility

Student teams must be enrolled in undergraduate degree programs related to the mining and minerals industry at a college or university. **Participants must be SME Student members in good standing**.

2.2 Team Size, Makeup and 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 previously been awarded an undergraduate degree may still compete as long as:

1. The previously awarded degree is not in a mining-related engineering discipline (such as mining, metallurgical, chemical or geological).
2. They are currently enrolled in an aggregate related, undergraduate degree program and will remain enrolled through the entire competition.
3. They obtain written permission from the SDC Committee.

Teams will register for the competition through the "Submit Team Information" button on the Metallic Student Design Competition page of the SME website,

https://www.smenet.org/Professional-Development/Awards-Competitions/Metallic-Student-Design-Competition

If there are any issues with the registration process, please contact either Deniz Talan (deniz.talan@mail.wvu.edu) or Mona Vandervoort (vandervoort@smenet.com). Please allow at least three (3) business days between team registration and desired start date.

In the event that a team member must drop out of the competition for any reason, the SDC 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 Stage of the competition**. The balance of time that remains 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 Coaches and Outside Assistance

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

During each Stage of the competition, **no** direct input from anyone outside the team (phones calls, emails, etc.) shall be allowed after the problem-solving period begins. Passive use of the Internet as a search tool for additional

reference information will be acceptable. 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 Stage 1, if any, may ONLY be directed to the SDC, which will determine if there is an appropriate answer. Questions during Stage 2 will be communicated directly to the SDC committee at the competition site. It shall be at the discretion of the SDC committee whether a response is given to any question. Any answers to questions during Stage 2 will only be communicated to the team that asks the question.

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 cause for rejection, a reduction in points or even disqualification from the competition.

During Stage 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

This competition uses data from actual metallurgical, mining or mineral processing companies. This is real data and will therefore represent the type of information you will have as a metallurgical, mining, or mineral processing 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. This requirement includes use of the data for senior design or capstone projects.

3 Stage 1

The SME Metallic Student Design Competition will be held in two Stages with the preliminary Stage held on the respective team's campus and the final Stage held in conjunction with the 2026 SME Annual Conference and Expo. Competing teams are comprised of up to six (6) undergraduate student members of SME and one (1) faculty advisor.

In Stage 1, the teams work on campus to provide a written solution, in English, to the competition problem provided by competition officials/judges. The teams have 30 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 28 consecutive day period of their choice 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 hours whenever it best fits the students' schedules (as long as it occurs within a 28 consecutive 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. Each submission must be submitted by the end of the 28-day period or by Sunday, November 23, 2025, whichever comes first, unless an extension is permitted in writing by Metallic-SDC.

3.1 Problem Solution

The solution submitted during this Stage 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 60 m^3 tank cell might be specified without detailing the make or model).

The solution should convey enough information to define the mine and process 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 hours per student to read the problem information, generate a solution, and create an organized report stating conclusions and recommendations. The total of 30 hours can be spread out over a 28 consecutive daytime period. A recommended distribution of the **hours** is as follows:

- 5 hours to read the problem, formulate a plan of attack, and break down into subgroups.
- 18 hours to work on the problem, address design issues, and formulate solutions.
- 7 hours to formulate the memo, write detailed descriptions of design solutions, translate (as 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 28-day time 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 30-hour limit, the members cannot work on the project and cannot discuss ideas and sections of the project. At the end of the 30 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/Metallic-Student-Design-Competition. If there are any issues with this submission process, please contact Deniz Talan (deniz.talan@mail.wvu.edu), Miguel Pugmire (miguel.pugmire@riotinto.com) or Mona Vandervoort (vandervoort@smenet.com).

Each team member is limited to 30 hours. That is to say, the time may not be distributed among the team members in an amount greater than hours. One person cannot work 50 hours while another person compensates by only working 10 hours to reach an average of 30 hours. It is hours per person. The team does not have to meet together for 30 consecutive hours, but each person cannot work more than 30 hours cumulative.

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

> ***Q:*** *Quote, "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 30-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 28-day period in which they are within their 30-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 30-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 plan 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 30 hours and must occur within the 28-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 30 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 Metallic 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/Metallic-Student-Design-Competition. Time is allowed outside of the 30-hour work time for transmitting the PDF.

3.4 Scoring

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

- Team Presentation - 15% of Stage 1 score
    - Spelling/Grammar (10/15%)
    - Neat/Clear/Precise (5/15%)
- Problem Solution and Approach – 75% of Stage 1 score
    - Accurately supported by equations and references (25/75%)
    - Correct/Accurate solution (45/75%)
        - Environmental Aspects
        - Feasibility/Simplicity of Design
        - Reserve Calculation
        - Logically Sequenced Mine Plan
        - Good Engineering Judgment
        - Documented Assumptions
    - Thought process easily understood (5/75%)
- Overall Project Design - 10% of Stage 1 score
    - The uniqueness of design/solution and organization

4 Stage 2

Stage 2 will be conducted at the 2026 SME Annual Conference and Expo in Salt Lake City, UT. In this stage, the design team will prepare a 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 "Board" who will have previously reviewed and judged the individual teams' written solutions from Stage 1. The specific problem that the design team will have to solve, and present will be given to the teams on Friday afternoon/evening before the 2026 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 approximately 30-45 minutes in which they will make their presentations. The order in which the presentations occur will be randomly selected.

4.1 Attendance

After the results of Stage 1 are announced in January, each of the top six (6) 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 Stage 2. If your team does not submit the form before the deadline, SDC - Metallic will assume that your team is unable to attend the competition and will open the spot to the next highest-scoring team.

Each team participating in Stage 2 must physically be present during the competition; no team will be allowed to give their presentation via Skype or any other video/audio conferencing device. Also, it is strongly suggested that teams stay at hotels within walking distance to their provided Stage 2 work rooms.

Teams attending Stage 2 are required to be student members of SME and register for the 2026 SME Annual Conference and Expo. Each team participating in Stage 2 will be completely responsible for all travel arrangements to and from Denver, lodging arrangements while in Denver, and conference registration for the 2025 SME Annual Conference and Expo. The SDC - Metallic is not responsible for any associated planning or costs.

4.2 Equipment

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 Stage 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 computer projection device, podium, and microphone will be supplied by the SDC for team presentations. The teams should be prepared with their own computer as a backup. The SDC - Metallic will not provide internet access for the presentations. Furthermore, any additional equipment required for a presentation should be coordinated through the competition coordinator. There may be additional charges for internet access, or an additional presentation room set up. These charges must be paid in advance by the requesting team.

4.3 Room Setup

The SDC will furnish a work room for each team with enough tables and chairs for each member of the team. Ample workspace is available in each workroom for two extra tables (possibly three) and chairs. Worktables and chairs may 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 in the workrooms must remain during the competition.

4.4 Preparation Time

The design team will have from the time the problem is distributed on Friday afternoon until the team's specified 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 - Metallic personnel will supervise this Stage. The team will be expected to prepare for the presentation in their work room. The advisor and SDC personnel will supervise this Stage.

4.5 Presentation

Each design team should be prepared to give a 20–25-minute presentation followed by a 20–25-minute question and answer period immediately following the presentation. 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).

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

- Presentation (40% of Stage 2 score, broken down as follows)
    - Visual Displays (7.5%)
    - Speaking Skills (10%)
    - Team member participation (7.5%)
    - Quality of Presentation (15%)
- Solution (40% of Stage 2 score)
- Question/Answer Session (20% of Stage 2 score)

4.8 Awards

Up to six (6) teams will compete in Stage 2; however, the SDC Committee reserves the right to adjust this number as events develop. The final scores will be determined by a combination of the Stage 1 and Stage 2 scores.

Cash prizes will be awarded for the top three teams, and they are 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

The cash prizes may change as the competition budget is finalized.

4.9 Resume Book

One of the major benefits of participating in the *SME Student Design Competition - Metallic* is being able to show yourself off to a large list of corporate sponsors. The reason corporations sponsor the event is to have a look at the future of the mining industry, you!

The SDC - Metallic Committee would like to give you an opportunity to submit your résumé to the sponsoring companies. The SDC - Metallic Committee will create a résumé book to distribute to any company that sponsors the event. If you would like, you can submit your résumé to Mona Vandervoort (vandervoort@smenet.com) so your résumé can be added to the book.

5 Questions

5.1 Stage 1

If questions arise during Stage 1, an e-mail should be sent to Deniz Talan (deniz.talan@mail.wvu.edu) and Miguel Pugmire (miguel.pugmire@riotinto.com) explaining the question. Questions must be sent to both contacts above to ensure a prompt response. Both the question and answer will be forwarded to all other teams as appropriate.

The committee will review the questions, and a response will be issued as appropriate. An effort will be made to answer the questions in a timely manner; however, as all of the teams will be working on the problem on different schedules than the SDC - Metallic, it may take up to 48 hours for a response. Neither the 28-day working period, nor the 30-hour time limit will be extended due to delays in the SDC responding to questions.

5.2 Stage 2

During the second Stage of the competition the SDC - Metallic, will be available during normal business hours to answer questions by the competing teams. The SDC - Metallic, may decline to answer individual questions during this Stage of the competition. If the SDC - Metallic does provide an answer, the question and answer 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 detailed and supported.

6 Competition Timeline

The 2023-2024 Student Design Competition is scheduled as follows:

Registration Opens	9/1/2025
Stage 1 Begins	9/22/2025
Last day to register your team - No deadline; however, the teams must submit their Phase 1 solution by the date below.	
Last Day to Submit Stage 1 Problem Solutions to SDC Committee	11/23/2025
Results of Stage 1 Presented to Teams	12/21/2025
Stage 2 Begins	2/20/2026
Stage 2 Presentations and Awards	2/22/2026
2026 SME Annual Conference and Expo Begins	2/22/2026

7 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/Metallic-Student-Design-Competition. If there are any issues with the registration process, please contact both Deniz Talan (deniz.talan@mail.wvu.edu) and Mona Vandervoort (vandervoort@smenet.com). Please allow at least three (3) business days between submittal of the registration and the Stage 1 start date.

8 Statement and Confidentiality and Honor

When registering your team online (through the Student Design Competition page of the SME website, https://www.smenet.org/Professional-Development/Awards-Competitions/Metallic-Student-Design-Competition, 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.

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 competition. I will not seek any outside opinions or assistance during this competition from anyone, including professors, peers, friends, family, or mining/metallurgy/mineral processing professionals. I will not share any information given in the Problem with persons unaffiliated with the SME Student Design Competition - Metallic 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.