

IWPC 2024

— TOGETHER FOR CLEAN WATER —

ILLINOIS
Water Environment Association

STUDENT DESIGN COMPETITION 2024 ENTRY GUIDELINES

**ILLINOIS WATER ENVIRONMENT ASSOCIATION
STUDENT DESIGN COMPETITION
2024 GUIDELINES**

This event, sponsored by the Illinois Water Environment Association (IWEA), requires that student teams design and present a project of their choice that relates to the field of water/wastewater engineering, stormwater, or water resources. Any questions regarding the program guidelines should be directed to the Students & Young Professionals (S&YP) Committee – Student Design Group:

**S&YP Committee –
Student Design Group**

Meghan Drew, P.E.
Civil Engineer
Black & Veatch
180 N Wacker Drive, Suite 550
Chicago, IL 60606
Phone: 312.683.7828
Email: DrewM@bv.com

Jenny Loconsole, P.E.
Process Engineer
Black & Veatch
180 N Wacker Drive, Suite 550
Chicago, IL 60606
Direct: 312.346.3132
Email: LoconsoleJ@bv.com

INTRODUCTION

The IWEA Student Design Competition (SDC) is intended to promote a “real world” design experience for students interested in pursuing an education and/or career in wastewater, water resources, and environmental engineering. This competition tasks teams of student members within IWEA to design a problem statement and present a project solution meeting the requirements of their problem. This competition is intended for both undergraduate and graduate students. Design work from a capstone project can also be submitted.

STUDENT DESIGN COMPETITION

There will be one competition for all projects. The project can cover either wastewater (WW) or environmental design (WE). The Wastewater design is intended to include the traditional wastewater collection and treatment design projects, such as hydraulic capacity design, upgrades to existing systems, biosolids handling, etc. The Environmental design is intended to cover current contemporary engineering topics, including sustainability, drinking water treatment, water reuse, wetland construction, stormwater, urban runoff, etc. The students will indicate on the Entry Form the category in which they will participate (WW or WE). The competition consists of an oral presentation.

The scope and extent of the project should be at the level of a junior, senior, or graduate engineering/science student in a design or capstone course. Students may participate in the competition if they are not enrolled in a capstone course. Students are expected to work together as a team to recommend a solution, with little assistance from an advisor and/or professor. Students may use whatever references or resources, with appropriate citations.

Students are expected to perform the necessary calculations for the project. This is not intended to be solely a research project or a literature review, but a comprehensive design project. Although some initial literature review and/or research will be required, the bulk of the project should incorporate pertinent calculations for the design.

For example, if the project involved a wastewater treatment plant expansion, judges would expect that the team performed the following:

- Hydraulic profile
- Preliminary sizing of major equipment (aeration basins, clarifiers, chlorine contact chambers, etc.)
- Incorporate information from different manufacturers
- Population analysis to determine design flow rates
- Preliminary cost evaluation
- Decision matrix (provide reasoning of why you ended up with the chosen process or design)

Environmental projects may include the following:

- Reuse
 - Methods for reuse
 - Irrigation: pumping requirements, pipeline sizing
 - Deep Well/Aquifer recharge: injection well sizing, required depth, injection flow/pressure
- Wetland Construction
 - Impacts (economic, social, etc.)
 - Decision matrix (weighted ranking system/alternative analysis)
 - Water quality parameters
- Stormwater
 - Runoff flow/volume methodology and calculations
 - Stormwater pond sizing, retention time, capacity, inlet/outlet pipe size requirements
 - Water quality parameters

Teams will be evaluated by a panel of judges selected from the IWEA community and will be scored based on their oral presentation skills. The date for the presentations is **March 18, 2024**, during the Illinois Wastewater Professionals Conference (IWPC) (www.illinoiswpc.org). After the presentation, judges are permitted to ask questions.

ENTRY FORM

Each team shall submit an entry form for the competition. Each team will be required to submit an abstract on Page 2 of the entry form (maximum of 250 words). While the abstract included in the entry form will not contribute to the overall score of the project, it is important to be as descriptive as possible. Entry forms are available on the IWPC website at https://iweasite.org/student_design_competition.php.

There is no entry fee for the SDC. If interested in attending other portions of the conference, registration information may be found at www.illinoiswpc.org. Each team must also submit the Participation Form later that includes the names of team members and presenters.

PRIZES

IWEA is providing prizes for the 2024 program. The prizes are shown below and will be awarded following the Student Design Competition at IWPC. Students will indicate on the Entry Form where the check should be sent.

PRIZE	AWARD	MONETARY VALUE
First Place	IWEA Scholarship	\$1,000
	WEFTEC2024 Travel Allowance	TBD

The first-place teams will be required to present their projects at the Water Environment Federation (WEF) Student Design Competition, to be held at WEFTEC2024 in New Orleans, LA, on October 5 – 9, 2024. The competition will take place on October 6, 2024. The winning team will be entered into one of two categories for WEF – Wastewater or Environmental. The winning team will need to follow the WEF deadlines and guidelines for the national competition, located on their website at <https://www.wef.org/membership-community/students--young-professionals/yp-student-design/>. Note that some items may be due as early as May, **and please note that the WEFTEC competition will require a written design report.**

The first-place winner will be announced at the conclusion of the SDC and during the IWPC Awards Luncheon. Team members or designees of the team are encouraged to attend the Awards presentation.

GENERAL REQUIREMENTS

The general requirements for participation in the competition are:

- ☐ Team size will be limited to a maximum of eight students per team.

- ☐ The sponsoring professor or professional should provide limited assistance to the students on an as needed basis, keeping in mind that this project should be the students' opportunity to showcase their knowledge gained throughout their time in school.
- ☐ The engagement of the professional community and the local chapters of the IWEA is strongly encouraged. Project topics, design data, and feedback may be obtained from members of the professional community.
- ☐ Attendance at the Student Design Competition at IWPC in **March 2024**.
- ☐ Each member of each team must be a WEF/IWEA Student Member in good standing who:
 - Has been selected by his/her university to participate.
 - Has filed an application with IWEA prior to **March 8, 2024**. The same holds true for continuing Student Members.
- ☐ All entry materials become the property of the IWEA.
- ☐ A representative of IWEA will preside during the competition and ensure that there is adherence to the time schedule and event rules.
- ☐ The first-place team should be prepared to participate in the National Student Design Competition at WEFTEC2024 in New Orleans, LA, in October 2024.

WRITTEN SUBMITTAL REQUIREMENTS

There is no written submittal, aside from the Entry Form and Abstract, that will be required as part of the Student Design Competition. For the winning team that competes at WEFTEC2024, a written design report will be required ahead of that competition. More information on that competition and submittal requirements can be found at <https://www.wef.org/membership--community/students--young-professionals/yp-student-design/>.

PRESENTATION REQUIREMENTS

Each team will be allowed a twenty-five (25) minute block of presentation time, including a fifteen (15) minute presentation and a ten (10) minute question and answer session. There will be time warning signs held up during the presentation when there are 5 minutes and 1-minute remaining to help the students from going over their time allotment. To stay on schedule, the presentation will be kindly cut off after 15 minutes, even if there are slides remaining. Therefore, time management and practice are important.

Teams are asked to email handouts of their presentation slides for the judges. The judges will use these during the presentations so last-minute changes should be limited.

Teams may consist of up to eight members. However, a maximum of four team members shall be permitted to present and answer questions. If there are four or less team members on the presentation platform, each member is expected to have a role in the presentation and in answering questions. If required, one additional team member (a fifth team member) may be on the presentation platform, but shall be dedicated solely to advancing the presentation slides. Additional team members are not permitted on the presentation platform or allowed to speak during the presentation or the question and answer period. However, they are encouraged to show their support as audience members. All presenting team members (excluding the A/V member) are encouraged to participate in the question and answer session. Questions are drawn from the judging panel only. The presentations will take place virtually with details to be provided.

SIGNIFICANT SUBMITTAL ITEMS AND DATES

Each entry will consist of the following:

- ☐ An official **Entry Form** submitted through the IWPC website portal by 11:59 pm on **February 2, 2024**. This submittal does not need to identify team members but must include contact information for each team planning a submittal. Entry forms can be accessed through the link available at https://iweasite.org/student_design_competition.php.

If a team's topic changes after the entry form has been submitted, the team must contact the Student Design Group.

- ☐ A **Conference Call** will be held in February 2024. An exact date/time will be determined in early February. A conference call number and passcode will be sent out in late February to each team leader (listed on the Entry Form). **At least one team member from each team is required to call in.** The purpose of the conference call is to review competition rules and to answer any questions the students may have. Please notify the Student Design Group of any conflicts prior to the conference call.
- ☐ A **Participation Form** showing final team member names and presentation title, submitted to the Student Design Group by 11:59 pm on **March 1, 2024**. The presentation title should be related to the project topic listed on the Entry Form.
- ☐ The date for the presentations is **March 18, 2024**, at the Illinois Water Professionals Conference. The Student Design Group needs to receive the final presentation prior to the competition.

JUDGES AND JUDGING CRITERIA

The event will be judged by an impartial panel consisting of members of academia, public agencies and/or private consulting practices. The judging team shall have no direct affiliation/representation with any college participating, owner project, or engineering firm involved as part of the projects they will be judging.

The IWEA is a multi-disciplined environmental organization dedicated to quality in practice of the profession. Accordingly, judging will be based on the elements discussed below. Judges will use the scoring sheets provided by IWEA as the basis for judging of the students' designs; these scoring sheets will be provided to students prior to the SDC. The team with the highest score will be awarded First Place. In the event of a numerical tie, the winner will be by a vote of the judges. The final scores may not be released; however, comments and feedback from the judges will be compiled and provided to the students after the SDC.

PRESENTATION

Content

- To what extent was the subject of interest conveyed to a technical audience?
- Did the team give credit for source of material or contribution?
- How much knowledge of subject was exhibited?
- Was work independent and original?
- Was subject technical or general in nature?
- Was the approach effective in solving the problem statement?
- Was the problem clearly stated?
- Did the students present a viable solution to the problem?
- Was there any innovation or "thinking outside the box" on the design approach?
- Were the design challenges addressed and overcome?

Organization

- Were there an appropriate number of slides?
- Were the slides cluttered with too many details?
- Was there enough time for the audience to understand the information on each slide?
- Was there sufficient background information provided to introduce the audience to the subject?
- Were facts developed in logical and continuous sequence?
- Was there a definite conclusion and was it adequately based on the facts or data presented?

Delivery and Effectiveness

- Were the words distinctly pronounced and did presenter use proper volume in delivery?
- Did the presenter use proper English, and was the vocabulary sufficient?
- Was personal appearance appropriate?
- Were there any distracting mannerisms?
- Was the manner of delivery (conversation, memorized, read from manuscript) satisfactory?
- If visual aids were used, how effectively were they used?
- Was the presentation within the time limit allowed for presentation?
- Were the speakers talking at an appropriate pace or were they rushed?

Discussion

- Did the presentation evoke spontaneous questions from the panel?
- Did questions indicate the need for clarification of facts presented or were they merely of the type seeking additional information?
- How readily and with what self-assurance did the speaker answer questions?
- Did the answers indicate knowledge of subject beyond that disclosed in the original presentation?

PENALTIES

Penalties may be assessed for misconduct by any of the teams and are at the discretion of the Student Design Group.

Penalties may include:

- Points taken off from the final score
- Disqualification of an individual team
- Disqualification of a school

Some of the items that can lead to penalties include:

- Failure to submit entries on time
- Failure to comply with abstract guidelines
- Failure to comply with presentation guidelines
- Inappropriate assistance from a mentor, professor, or other outside source
- Plagiarism, all sources and resources must be properly cited
- Failure to obtain WEF/IWEA memberships
- Misconduct by the team, sponsors or others associated with the team
- Failure to arrive on time on day of competition
- Failure to be present for entirety of competition

SPONSORSHIPS

In addition to IWEA funding, the SDC accepts financial contributions of sponsors. If you know of an organization who is interested in sponsoring the SDC, please have them contact the Student Design Group below. All sponsors will receive recognition for their support and their logo will appear on all SDC materials and the IWEA S&YP webpage.

INTERNET LINKS

www.iwea.org
<https://illinoiswpc.org/>

QUESTIONS OR COMMENTS

Please review the entire SDC Guidelines and contact the Student Design Group for any clarification on any of the rules or guidelines of the program at:

S&YP Committee –
Student Design Group

Meghan Drew, P.E.
Civil Engineer
Black & Veatch
180 N Wacker Drive, Suite 550
Chicago, IL 60606
Phone: 312.683.7828
Email: DrewM@bv.com

Jenny Loconsole, P.E.
Process Engineer
Black & Veatch
180 N Wacker Drive, Suite 550
Chicago, IL 60606
Direct: 312.346.3132
Email: LoconsoleJ@bv.com

Good luck and thank you for your interest and support!

EXAMPLE SCORING SHEET

2024 SDC PRESENTATION

Name of Team/University: _____

Project Title: _____

Judge: _____

Presentation technical Content - 45 pts

1. Presentation included sufficient depth of technical information (15 pts)..... _____
 2. Team displayed adequate knowledge of subject and presentation content (15pts)..... _____
 3. Recommended design solution was original and innovative (15 pts) _____
- TOTAL (45 pts).....** _____

Presentation Organization - 20 pts

1. Sufficient background information was provided (5 pts) _____
 2. Essential facts were developed in a logical and continuous sequence (10pts)..... _____
 3. Recommended design solution was based on facts and data presented (5 pts) _____
- TOTAL (20 pts).....** _____

Delivery & Effectiveness - 25 pts

1. Presentation and visual aides were clear, legible, and effective (10 pts) _____
 2. Vocal delivery was appropriate (not memorized nor read directly; proper volume, distinct pronunciation, and appropriate vocabulary used) (10 pts) _____
 3. Eye contact was made with judges and audience(5 pts)..... _____
- TOTAL (25 pts).....** _____

Discussion - 10 pts

1. Answers to questions posed by judges were clear and technically correct (5 pts)..... _____
 2. Answers indicated knowledge of subject beyond presented material (5 pts) _____
- TOTAL (10 pts).....** _____

GRAND TOTAL (100 pts) _____

COMMENTS:
