



# Student Design Competition

The SYPC holds numerous opportunities for students to participate at WEFTEC, as well as support their transition into becoming a Young Professional. One of the greatest opportunities for students to get involved and make this transition is the Student Design Competition! The competition is hosted by the Student Design Subcommittee, a subset of the Students and Young Professionals Committee (SYPC) of WEF.

The purpose of the competition is to promote real-world engineering experience to students through the development of a preliminary design report and presentation, similar to what could be developed for a consultant-client interview. This competition is typically geared toward upper classmen or graduate students, however all students are encouraged to participate.

The WEF Student Design Competition is divided into two categories, **wastewater** and **environmental**. The intent of these divisions is to recognize the value of projects that don't deal with traditional plant design but deal with the broader current industry trends like watershed management, stormwater practices, humanitarian projects, etc. The basic design/decision process for each category is the generally the same for each category and is as follows:

- Develop an initial understanding of the design options
- Create a list of solution alternatives
- Complete an economic analysis consisting of capital and operational costs and development of a present worth analysis or other methodology for considering long-term economic benefit
- Create a design matrix and quantitatively and/or qualitatively ranking the alternatives
- Finalize an alternative recommendation with appropriate supporting documentation
- Demonstrate design implementation, achieved through preliminary drawings, equipment selection and sizing, operation recommendations, schedule, etc.

### **Support from University and Faculty Advisor**

These projects can be quite time intensive and technical. That is why it is important for students to have support from their university and a faculty advisor. Due to the level of time and learning involved, some student design teams are supported through their university by being able to participate in this student design competition as part of their senior design class. Although this isn't necessary to participate, students are encouraged to check with their faculty advisor and university program coordinator to see if this is available for them.

The Faculty Advisor plays a vital role in the development of the team's submittal and presentation. This competition is intended to promote "real world" design experiences for students interested in pursuing an education and/or career in water/wastewater engineering and sciences. The Faculty Advisor guides students throughout the process by providing input and feedback on the project. However, they are not intended to provide solutions or constant guidance to students during the design. It is suggested, that students have weekly or bi-weekly meetings with their faculty advisor throughout development preparation of the design project.



### **Support from Regional Member Association (MA)**

Students are encouraged to work with their Regional MA to develop a problem statement for the competition. However, this can be done through the faculty advisor as well. The regional MAs are often well prepared to help develop a problem statement as they are typically comprised of working professionals who are working on challenging problem statements existing in the industry today. It is a great opportunity for operators and consultants to help foster a relationship and provide support to students in their region.

In addition to development of a problem statement, MAs are encouraged to host a regional MA student design competition to allow various student chapters in their region to participate and ultimately select a chapter to represent the MA at the competition held annually at WEFTEC. If a student team is interested in participating in the competition at WEFTEC, they need to check with their local MA to see if a state or area wide competition is already in place. [Click here](#) to find the Member Association for your state or region.

If your MA does host a competition, contact your MA's student or YP committee chair for more information on the competition, deadlines, and procedure for moving forward with the competition. A team may need to declare their interest in competing prior to showing up at the competition. Contacting the local MA ahead of time will help keep you informed of all of the correct procedures for submittals and presentations. The MA may have already decided on a problem statement and can assist with distribution of plans, existing data, site visits, etc. to aid in the development of the submittal.

If there is not a competition in your MA, contact Megan Livak at [MLivak@wef.org](mailto:MLivak@wef.org) and express your interest in participating in the competition at WEFTEC. Depending if there is more than one team that expresses interest in your MA, you may be allowed to attend WEFTEC without moving through the MA competition process. Teams will be allowed entrance on a case-by-case basis, and it is required to declare your interest prior to the competition. WEF will put you in touch with the appropriate SYPC subcommittee member who will work with you on development of your submittal, presentation, and required deadlines. A team wanting to participate in the WEF competition without support from a MA will need to develop their own problem statement and solution that depicts a real-world problem municipalities may face. It will be up to the team to determine applicable problem data and the necessary steps to solve the problem. For example, a team deciding to enter the competition may choose to work with a local utility to solve a problem they have with hydraulics or plant design, however all of the necessary steps to achieve the solution will need to be solved (statement, alternatives, decision matrix, solution, etc.) in order to fully meet the scoring rubric set forth by the WEF competition.

### **Regional MA Student Design Competition**

The primary responsibility of the regional Member Association is to develop a problem statement for the student design teams to tackle. The most successful student chapters often have design problems that are currently trending issues in the industry. A great way to find these projects are to ask the regional operators and consultants in your MA to find what projects exist and if they are willing to provide data and a problem statement for the students. It's also very helpful for the students to be able to visit the project site and gain some real world perspective of the project.

The statement must consist of enough work to involve at minimum 3-4 students on a practical basis with limited research applications. For example, problem statement could involve designing a new biosolids alternative for a local municipality, using their actual solids criteria and constraints for a design (i.e. space, monetary, technology, etc.). It would be preferable if the local utility work with students, providing them with site visits, real-time information and sampling results, record drawings and reports to help foster the applicability of the design and help develop a practical understanding of the project.

After publishing the problem statement and appropriate supporting information, distribute to appropriate technical universities interested in participating in the competition.

It may also be important to get a problem statement to the students before the fall semester as some Universities may offer participation in this event as a senior design course. Some Universities will also offer this as a course in the spring. Either way, create an environment where students can easily participate in this program. Those teams who begin work on the project in the fall semester should be discouraged from also continuing their work into the spring semester to give all students the same amount of time to work on the project, although, this is not required. Students who participate in this competition and have school support through taking it as a class or receiving credit for their participation are often the most successful, but university support is not required to participate. As for the regional competition to be hosted by the regional MA, the best time of year to host the competition is at the end of the spring semester, towards the end of April/early May. This allows the students to participate before graduation. Then, once a winner is selected, from the regional MA competition, the MA must submit to **Megan Livak** their nominated team by the beginning of May. Then the students and MA have the summer to plan any available funding and coordination with the student design team to ensure they are able to present their project at WEFTEC in the fall.

#### Schedule:

A timeline outlining the entire student design competition process, from problem statement development to the competition at WEFTEC, is outlined below. Please note that this process can vary depending on school university/college support (i.e. competition counting as senior design class, bare campus during summer months, etc.) and MA support (hosting a regional design competition). Ultimately, the final design competition will be held had the same time each year when WEFTEC is scheduled.

- 4-9 months prior to WEFTEC – Students obtain participation guidelines and develop a problem statement
- 6-8 months prior to WEFTEC – request a registration form outlining member and contact information for each team member and for the advisor.
- 4 months prior to WEFTEC – request abstract from team giving a description of what their project entails.
- 2 months prior to WEFTEC – request submittals of their written report, either in hardcopy or electronic for distribution to the competition judges.



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- 1-2 months prior to WEFTEC – request competition judges to score the notebooks using the scoring matrix. They will need to return score sheets back to the organizer prior to the competition.
- 1-2 weeks prior to WEFTEC – randomly select the presentation order based on the competition categories (environmental and/or wastewater) and send out the presentation order to all of the teams for preparation.
- 1-2 weeks prior to WEFTEC – request final presentations from the team to upload to the convention center website.

## Path to WEFTEC

Depending on the timing of the MA Student Design Competition the MA or student team (if no additional student teams are participating in your MA region) must let WEF know they are planning on sending a team to the competition at WEFTEC so the appropriate amount of time can be reserved for the overall competition. The WEF competition has 4 major deadlines leading up to the WEFTEC event which is typically held in September/October:

- May – intent to compete is due to the Student Design Competition Subcommittee Chair and Megan Livak.
- June – completed abstract (100-word or less) and team registration form is due electronically. The sample forms can be found as appendices in the WEF Competition Guidelines.
- August – final submittals are due, either in hardcopy or electronic format (will be specified) to the Subcommittee Chair for distribution and scoring by the judges.
- September/October – presentation and scoring by the judges at WEFTEC.

## Deliverables/Judging

Each team will be expected to provide a **written report** and a **formal presentation** at all of the competition levels (WEFTEC & Regional MA). The written submittals will be judged prior to the presentations on their own scoring matrix, and the verbal presentations scored by a panel of judges. Both of the scores will be combined for determination of the highest scoring team.

The Student Design Competition subcommittee chair can provide examples of the expected deliverables (written submittal and presentation) should students request it in order to gain an understanding of the level of quality that is expected. The student team is responsible for completing the required amount of work and meeting all of the necessary deadlines for inclusion into their MA level competition as well as WEFTEC.

## Awards

The MA should decide during the development of the competition if prize monies will be awarded and how and when these monies should be used. The winning team from the MA is invited to attend the WEFTEC national Student Design Competition at the WEFTEC host city in September/October. To attend this competition, the team is expected to provide the financial requirements to attend, WEF will not reimburse teams to attend the competition. The MA is encouraged to provide support to the winning



team to attend WEFTEC and present their design on a national stage, amongst the winning teams from around the country.

The WEFTEC competition allows four team members to present in the competition; however all of the team members may attend WEFTEC. It is free for students to have a full conference registration, and many opportunities exist to reduce meal and transportation costs.

If the MA intends to provide financial support to send a team to WEFTEC, it should be made clear the expectations for travel arrangements, professional development, attendance, and MA guidelines prior to WEFTEC.

Also, if the team wins the competition at WEFTEC it is important to know that WEF will award prize monies to the MA, not the individual team members. It is the decision of the MA on how to award those monies. For example, if a MA wanted to provide free memberships to the student chapter from those monies, they can create the account for those, rather than requiring individual reimbursements. The MA may also distribute the winning awards to the team members as incentive for the hard work toward completing the competition.

Good luck to all participants!!!

#### **Other Helpful Resources**

Looking for things like brochures, membership applications, sample publications? Call the WEF Customer Services Center at 1-800-666-0206 to get any material you might need.

**WEF Student Contact:** Megan Livak ([MLivak@wef.org](mailto:MLivak@wef.org)); Phone: 703-684-2400 x7220