

Experimentation and Lab-Oriented Studies Division Call for Papers for the 2024 ASEE Annual Conference

The Experimentation and Laboratory-Oriented Studies (ELOS) Division invites abstracts for papers for the 2024 ASEE Annual Conference. ELOS is a multidisciplinary division devoted to innovations and best practices for laboratory instruction.

Papers addressing, but not limited to, the following topics are requested:

- Pedagogy and best practices of laboratory courses
- Inquiry-based experiential learning
- Hands-on laboratory instruction
- Virtual and remote experiments and laboratory instruction
- Laboratory exercises using augmented reality (AR)/virtual reality (VR)
- Integration of laboratory experiments and courses in an online environment
- Computer-assisted data acquisition
- Laboratory exercises or design projects that use microprocessors (Arduino, Beagle Bone, Raspberry Pi, Android, etc.)
- Horizontal or vertical curricular integration of laboratory experiments and courses
- Unique, multidisciplinary laboratory experiments and programs
- Pedagogy and best practices for undergraduate research projects
- Discipline-specific experiences and research in laboratory-based instruction (e.g., in mechanical, electrical, or chemical engineering)

ELOS sponsors technical sessions with both **traditional, slide-based academic presentations (technical and work in progress papers)** and **live demonstration (bring your own experiment papers)** sessions at the ASEE Annual Conference. Papers considered for both types of sessions use the standard review process for ASEE Conference papers, but with slightly different review criteria as described below.

ELOS supports a vivid discussion among a diverse group of faculty at the ASEE Annual Conference. Hence, the division encourages submissions from both scholars of teaching and learning and educational researchers. Collaborative work and submissions from representatives of both groups is also encouraged and very much welcome.

Submission types

1. Technical Papers

Attendees at ELOS sessions have expressed strong interest in the practical aspects of instruction, which is especially relevant to laboratory instruction. Papers describing the implementation, assessment, and integration of both hands-on and online exercises with laboratory or lecture-based classes are encouraged.

Presentation type: Slide-based presentation

2. Work in Progress (WIP) Papers

Work-in-progress papers will also be considered. Abstracts and full Submission of this paper type MUST have a title that begins with “Work-in-Progress: paper title” with the colon separating the phrase from

the remainder of the title. Work-in-Progress submissions are for reporting on work that is still in the process of study and/or implementation for which results will not be available by the time of draft paper submission.

Presentation type: Slide-based presentation

3. Bring Your Own Experiment (BYOE) Papers

The BYOE sessions involve live demonstrations of laboratory exercises and equipment. The content of the papers in BYOE sessions focuses more on implementation, which includes fabrication, deployment, and student usage in addition to the underlying pedagogy. BYOE sessions will be publish-to-present. BYOE abstracts must be submitted using the ASEE submission portal. Submissions should be identified by including “BYOE” at the beginning of the title of the abstract. For example, a submission to demonstrate an experiment on optical encoders would be titled “BYOE: A Deconstructed Apparatus for Exploring Rotary Optical Encoders”.

Note that the BYOE paper should be in the form of a procedure description and instruction. The paper should be written in a manner that will allow others to easily duplicate the experiment and explain the motivation for the development of the experiment and the expected learning outcomes. An example of a BYOE paper is posted at <https://sites.asee.org/elos/>. BYOE papers that are selected for presentation after the review of the required paper will be published in the Proceedings of the ASEE Annual Conference.

Presentation type: Live demonstration

Additional Notes:

Student Papers: The division strongly encourages student authors to submit papers and accepts student papers in all the three above-described submission types. Student papers should have a student first author and a faculty member as a co-author, and students are expected to present at the conference. Student paper submissions should follow the regular guidelines and review process for the respective submission type, as appropriate.

Papers on diversity and inclusion: The division strongly encourages work that connects instructional experimentation and diversity and inclusion efforts. However, the contribution of the submitted work in that area should be clearly placed within the context of the technique or the methodology of the presented experiment of laboratory.

Review process

Technical and WIP Papers

Abstracts should be 500 words or less. Authors of accepted abstracts will be invited to submit full-length or work-in-progress papers for peer review.

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Abstracts will be reviewed against the following criteria:

- a. Does the work fit with the theme of ELOS, i.e. does the paper concern experimental and/or Laboratory-oriented learning experiences?
- b. Does the content of the abstract suggest that a full paper is likely to be of sufficient merit to warrant review?

Papers in the Technical Paper and WIP Paper categories will be reviewed against the following criteria:

- a. Readability: Is the paper well written? Is it free of grammatical and spelling errors? Is the paper easy to read? Are the key findings made obvious to the reader?
- b. Technical merit: Is the analysis sound and well documented? Are the measurement techniques carefully defined and appropriate to the quantities being measured and the appropriate units used? Do the discussion and conclusions follow from the data and analysis presented in the paper? Are assertions of improvements in education supported by rigorous assessment?
- c. Use of Figures and Graphics: Are the figures and graphics clear and effective at illustrating the equipment and data? Do the figures and graphics support the discussion and conclusions? Are the figures and graphics sufficiently explained by a discussion in the text of the paper? Are axes labeled properly and units indicated?
- d. Innovation in Education: Does the paper describe an innovative approach to laboratory-based instruction? Does the paper contribute to the advancement of laboratory-based instruction?
- e. Broad Interest: Is the paper of interest outside of a narrowly targeted audience? Is there a potential crossover of interest to other subject areas or audiences?
- f. Significance and Impact: Is the paper of significance relative to other papers in the same field of interest? Will other researchers or instructors in the same field cite the paper? Is the paper likely to have an impact on the practice of engineering education, or future research in engineering education?
- g. References: Are there sufficient and appropriate references on prior research on engineering pedagogy applied by the authors and review of similar work carried out by other educators in the field?

BYOE papers

The review process will follow the same deadlines as the standard ASEE abstract and manuscript process with peer review. Abstracts should be 500 words or less. Authors of accepted abstracts will be invited to submit a full-length submission for peer review.

BYOE Abstracts will be reviewed against the following criteria:

- a. Is the motivation for the development of the experiment clearly explained?
- b. Is the description of the experiment that will be demonstrated during the BYOE session sufficient?
- c. Does the content of the abstract suggest that a full submission will be of interest to others in the field?

BYOE submissions will be reviewed against the following criteria:

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- a. **Readability:** Is the description and associated support materials well-developed, easily read/understood, free of grammatical errors or visual inadequacies? (Does it communicate well what it intends to?) Is the experimental procedure made obvious to the reader such that a person in the field could adopt/adapt the experiment?
- b. **Technical merit:** Is there sufficiently detailed information provided so that others can reproduce the experiment? Are the measurement techniques carefully defined and appropriate to the quantities being measured? Does the experiment achieve the stated educational objectives?
- c. **Use of Figures and Graphics:** Are the figures and graphics clear and effective at illustrating the experimental apparatus? Are the figures and graphics sufficiently explained by description in the text of the paper? Are axes labeled properly and units indicated?
- d. **Innovation in Education:** Does the BYOE submission describe an innovative approach to laboratory-based instruction or an approach that addresses a fundamental student misconception through a hands-on activity?
- e. **Broad Interest:** Is the paper of interest outside of a narrowly targeted audience? Is there potential for crossover of interest to other subject areas or audiences?
- f. **Significance and Impact:** Is the submission of significance relative to other papers in the same field of interest? Will other researchers or instructors in the same field adopt the demonstrated experiment? Is the submission likely to have an impact on the practice of engineering education?
- g. **Logistical feasibility:** Is the experiment transportable enough to bring to the conference for demonstration? If it is not transportable, has it been shown that a reasonably translatable account of its design and implementation can be presented such that the audience would be able to adequately understand it? Can it be represented in some way to effectively serve as a demonstration without actually bringing it?

Awards

ELOS sponsors three (3) Best Paper Awards and one Best Student Paper Award consisting of certificates and cash prizes of \$300 each. All papers submitted to the division, including BYOE papers will be considered for these awards. Preliminary screening for Best Paper Awards will be based on the first full-length draft submitted for review after the abstract has been accepted.

For more information, contact:

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