

Industry/Organization Practicum Support Guidelines

CSU's Doctor of Engineering (D.Eng.) in Systems Engineering program focuses on mentoring students to hold positions at the highest levels of the engineering profession. The program emphasizes problem solving, leadership, and addressing the enterprise-level challenges that arise during technical development, as well as the ability to balance diverse technologies and competing stakeholder priorities with a system. As technology continues to advance and systems increase in complexity and sophistication, systems in every technology sector require individuals who can perform with high technical competence, professionalism, and understanding of the socio-economic systems and factors which can determine success. D. Eng in SE graduates are prepared to assume that challenge.

Completion of the professional doctorate in systems engineering demands mastery of the processes of Applied and Translational Research. Applied and Translational Research in Systems Engineering fosters the multidirectional integration of basic science, engineering/design-oriented, and enterprise-based research, with the long-term aim of improving the well-being of the public. Applied research expedites the movement between basic research and engineering/design-oriented research that leads to new or improved processes. Translational research facilitates the movement between engineering/design-oriented research and enterprise-based research that leads to better enterprise outcomes, the implementation of best practices, and improved societal and technical well-being. The professional doctorate seeks to develop researchers and practitioners with an in-depth understanding of each of these domains and the demonstrated capability to apply and translate Systems Engineering research to achieve the most beneficial enterprise and societal impacts.

Industry/Organizational Practicum Sponsor

Minimum Requirements of the Practicum Sponsor:

1. **Master's degree or higher in systems engineering, engineering, or another technical field related to SE**
2. **At least 10 years of professional technical experience**
3. **The Practicum Sponsor must be an active and practicing member of the systems engineering profession.** This can be demonstrated through current assignments/projects, active membership and participation in systems engineering organizations such as INCOSE, etc. The SE Program will seek demonstrated experience specifically in the field of systems engineering on the Practicum Sponsor's resume.
4. **The Practicum Sponsor should be a person with management-level status within the organization and hold a job title at least equivalent to a job title for which a D.Eng. graduate would qualify (i.e. Chief Engineer, Director of Engineering, SIT Lead, or other systems engineering leadership positions).** Typically, the student should be reporting to the Practicum Sponsor or the Practicum Sponsor should be in the student's managerial reporting line. This can be as an immediate supervisor, department head, vice-president, etc. Students may have assignments in a variety of multidisciplinary areas where it would be advantageous to have a practicum sponsor at a higher level of management in the company. The Practicum sponsor should be highly technically experienced as they will be part of the student's Advisory Committee.

The responsibilities for an Industry/Organizational Practicum Sponsor entail:

1. Assisting a student in the identification of a systems engineering project practicum of sufficient significance to the organization to make a measurable impact
2. Committing to guide the student in the completion of a systems engineering practicum
3. Providing updates to the advisory committee at least once per semester during practicum
4. Participating as a member of the student's advisory committee

Industry/Organizational Practicum Sponsor Confirmation Procedure

Initial confirmation of the Industry/Organizational Practicum Sponsor will be accomplished during the application process, when the Sponsor writes a letter of recommendation for the applicant detailing both their recommendation and their expected level of support and involvement in the practicum activities. **The Practicum Sponsor must include their current resume with their letter of recommendation so the above qualifications can be verified.**

Formal confirmation is accomplished when the student completes their GS6 Program of Study and forms their committee. The student will select their advisory committee with assistance from the D.Eng. Program and their default advisor, and the Practicum Sponsor will be formally evaluated and nominated by the Department Head to serve on the committee. The Practicum Sponsor will be considered to be a full voting member of the advisory committee upon approval by the Graduate School.

Objectives of the Practicum

Objectives of the D.Eng. in Systems Engineering Practicum are as follows:

1. To demonstrate the student's ability to apply advanced expertise to make an valuable systems engineering contribution in an area of concern to the organization or industry in which student participates
2. To demonstrate the student's capability in applying a systems engineering approach in a professional position to a professional project

Beginning the Practicum

Students are expected to complete most, if not all, of their coursework prior to beginning practicum credits. During the first semester of practicum credits (ENGR 786), students will work with their Practicum Sponsor and advisory committee to prepare a Practicum Proposal, detailing the expected practicum activities and goals. *Students must pass the preliminary exam, which is the evaluation of this proposal and the student's relevant skills, prior to beginning any on-site practicum activities.*

The practicum is an important part for understanding, applying, and demonstrating SE methodologies, principles, and skills for complex projects for the D.Eng. SE. The practicum will consist of 9 credits typically over 3 semesters. The applied research in this practicum should address a SE problem, issue, or application particularly valuable to the employer.

Reporting and Evaluation Procedure

The student will engage with their Practicum Sponsor and Advisory Committee to compose the technical documents necessary for the aspects of the Applied and Translational Research model. While in practicum credits, the student periodically (monthly, quarterly, etc.) prepares a report to their advisory committee summarizing practicum activities. The Practicum Sponsor submits a report to the student's committee at end-of-semester intervals and at the end of practicum. The final written report comments on the student's performance as a systems engineer and includes an evaluation of the extent to which each objective was satisfied. Upon completing the practicum credits and requirements, the student prepares the professional dissertation, recording practicum activities and outcomes.

Note on the Practicum

Students and mentors have the freedom to organize the practicum aspect of this degree. Hence, there is no one problem or model that is endorsed – all are valuable in their own way to the extent that they enhance the student's learning experience.