ICED 2012 Roles and Responsibilities

Government and/or Industry Sponsors:
The government and/or industry sponsors will act as challenge underwriters and have the prime responsibility for selecting and posing the challenge and share in the financial support of graduate students and undergraduate capstone design teams at participating University Hubs. They will provide a network of key subject matter experts (SMEs) to help facilitate the challenge solution process and to guide student teams. Sponsors will assist in the selection of university hubs and regional high-school hubs which will collaborate throughout the summer and school-year program and provide membership to support the Advisory Board and university and high-school Cohort Teams. Sponsors will also help identify potential resources within their organizations which may be used to help facilitate the primary goals of the challenge (e.g., hardware, test facilities, instrumentation, people, etc.). SMEs will help develop course content, provide lectures, and assist faculty and high-school Teacher-Coaches to develop age-appropriate, challenge-based curricula. Sponsors will support the program administration, advertisement, participant/student survey development, and will establish metrics to monitor performance (both individual and team). Sponsors will also help coordinate bi-annual challenge expositions, team presentations, events; and individual and team awards.

Subject-Matter-Experts (SMEs):
The SME members will provide in-depth discipline expertise in the form of lectures, online mentorship, course content, and help facilitate development of modeling and simulation tools and resources to support problem solution.

University Hubs:
Universities interested in collaborating on particular challenges will be evaluated based on their interest, expertise, and potential for in-kind support. They will be responsible for recruiting and selecting graduate students and undergraduate students with appropriate interest and expertise and submit a proposal based on an interdisciplinary, multi-year program which integrates specific research interests with capstone design projects focused on the solution of the selected challenge(s) and which is directly tied to a formal and/or informal course of study. University hubs will help select regional high-school hubs which will serve as centers for high-school student teams to receive instruction and educational support; meet to develop and mature ideas; and analyze, design, build, test, and mature concepts. University Hub faculty, graduate, and undergraduate students will provide mentorship and guidance for high-school Teacher Coaches and students (e.g., bi-monthly visits, lectures, and online course content development). One University Hub will be selected each year to host a one-week challenge workshop to help instruct incoming graduate and undergraduate students, SMEs, and high-school teacher coaches in program curriculum, instructional methodology, online collaboration,
and schedule of events and milestones. University Hubs will also be responsible for instituting and monitoring online educational tools (e.g., Khan Academy, MITx, etc.) and participant performance (students, Teacher-Coaches, SMEs, etc.) and in awarding mastery-of-skills badges/certificates based upon successful completion and demonstration of individual and team skills by students. Graduate and undergraduate program participants will also assist in the development of modeling and simulation tools; educational outreach and content, analysis and presentation.

**Graduate Students:**
Graduate students will collaborate with other university participants; assist in mentorship of undergraduates and capstone design projects, lead student teams in problem solution and identify key areas of current and future research areas. They will help develop modeling and simulation tools useful for problem resolution and also educational outreach for high-school programs.

**Undergraduate Students:**
Undergraduate students will collaborate with other university participants; identify capstone design projects for senior-year design programs, mentor high-school student teams and provide educational outreach and assistance.

**High-School Hubs:**
High schools interested in becoming High-School Hubs can apply annually prior to initiation of the summer workshop and will be evaluated based on academic excellence, expertise; analysis, design, build, and test resources, teacher competence, and commitment. Selected High-School Hubs will be responsible for: 1) nominating and providing Teacher Coaches to help develop and teach formal classes as well as informal (after-school) classes which will allow participation by students from other schools; 2) provide local facilities for after-school or weekend and 3) team/student facilitators and mentors.

**Teacher Coaches:**
Teacher Coaches will work with University Hubs and students; SMEs, sponsor engineers and scientists; and university faculty to help develop formal and in-formal curricula focused on solving program challenge and provide age-/skill-appropriate hands-on-learning experiences for high-school students and teams. Courses of study will be designed to meet rigorous agreed-upon core standards. They will help develop the evaluation tools and metrics which will be used to measure and award specific certificates of accomplishment which will be used to monitor student performance.