Engineering Curriculum:

How can one resolve the tension between the rapid pace of change and the idea that universities can develop advanced training that will be useful? The resource investment required to develop advance training is high, and given the rapid pace of advancement, the lifespan of such training is likely to be quite short. What is the incentive for universities to invest those resources? This rapid innovation/development cycle is also one of the barriers to more codified certification systems; such systems will always lag the need.

What graduate credentials or Certificate programs do we see in demand that would need upskilling of the current workforce?

How do we adjust undergraduate curricula to solve the immediate obsolescence problem? Developing and deploying new courses constantly on highly specialized topics across the entire field feels unmanageable outside of a very targeted set.

How can Industry 4.0 can be integrated into current engineering and technology academic curriculum? How should the framework of Industry 4.0 integrated curriculum look like?

Is there any attempt to rethink the mathematics required and taught in engineering programs? Often what is required is not what is needed in the workplace, and in fact deters many capable students from pursuing careers in engineering and other technical fields.

Communication skills has come up as an issue among new hires today and at the last webinar, but I imagine graduating students think they can communicate. How can we better bridge this divide in communication skills to better prepare students?

How do we address the tension between engineers frequently changing jobs vs. the time required to build interpersonal connections within an organization to then practice systems thinking and interdisciplinary collaboration?

Besides coops, internships, how about apprenticeship for work-integrated learning?

Students "need" to learn systems engineering software like those from Dassault or Siemens. Could just using this software (with an appropriate open-ended project) the way to create a system engineering curriculum? What are the essentials that a Systems Engineering curriculum should have?

Is systems thinking something that is best done as a stand along course or embedded throughout the curriculum, in the same way that efforts are being made to push entrepreneurial thinking throughout the curriculum?

Are we are losing talented systems thinkers to other disciplines? Do they end up leaving engineering because the curriculum is the "opposite of systems thinking"? If so, how do we prevent that?

Faculty Roles, Expectations and Support:

It seems that one of the challenges is that engineering faculty prepare students for work experiences that the faculty themselves have never had. Many engineering faculty members have never worked for, or even with, industry. How do we bridge that gap in a sustained way? Forums are one thing, but is that enough?

What is your opinion on faculty internships - in industry - to encourage building bridges?

What type of leadership development training do you have for faculty?

Is there a recommended approach on how to engage rank and file faculty and engineering administration in the systems thinking process?

How do you get faculty to listen and learn from industry? Embracing change may be what should be a key feature of promotion and tenure.

How can Deans foster that as a culture within the current tenure environment at research institutions for the above?

Role of Administration and Structure of Departments:

The speaker made the best case that I've ever heard for digital engineering. However, as computing and data become increasingly important, we in the Academy are increasingly creating colleges of computing, segregating our students and faculty. I support these efforts and lead one such college, but we in the Academy need help in thinking about how to better integrate engineering and digitization. Thoughts?

How to break up silos and focus more on interdisciplinary learning when faculty and employers were not trained in interdisciplinary work when they learned to be engineers?

Industry Role in Helping Academia:

Our national longitudinal study of engineering graduates' transition to work consistently points to a context gap rather than a competency gap. For example, learning the network of relationships, hierarchies, and preferences that govern communication patterns in individual organizations is a monumental task, and even when new graduates have strong general communication skills, they still have to learn the local organizational - and even unit or team - culture. How can industry improve its own on-boarding to better acculturate new hires?

Do we see engineers changing jobs much more often than in the past? And do we think the trend will increase?

General Comments:

We must all work together to solve the challenges the world is facing. Academia, professionals, students, citizens, everyone.

The human dimension to our advancement must be inclusive and diverse. Without it, we miss so many opportunities and design with a limited perspective.