

Integration of the Model Based Design – Industrial Approach - for Teaching Engineering Science

Aims:

Model-Based Design (MBD) has been adopted in the past two decades by engineers and researchers. By adopting MBD the development process is centered on the system model, from requirements capture, design to implementation and test throughout the process. Using Modeling, Simulation, Automatic Code generation and Test capabilities, MBD can be applied to any project ranging from small device implementation to enterprise applications and vehicles.

The French Ministry of Education is revamping the science and technology flow, starting from High-School to University levels with the integration of “Engineering” into schools. This is being done for two reasons: 1- to attract students to become engineers and 2- to reduce the gap between Educational schools and Industry by developing appropriate skills for the next generation of engineers.

Engineering Sciences topics are attracting more attention and weight during evaluations and exams. French teachers are increasingly adopting MBD workflows within their courses.

This workshop will present the association of the Model Based Design (MBD) and the recent French teaching Gap Analysis approach. This combination enables students not only to learn the Engineering workflow (or V-cycle) but also learn the disciplines relevant to the selected course.

Topics

In the session, we will present the Model-Based Design principles, the Gap Analysis approach and then describe the teaching concepts through a simple problem: the design of logic of the angular position controller of a DC motor. We will emphasize the different domains, mathematical equations describing the systems behavior and concepts relevant to engineering.

Target Group

The workshop is addressed at all engineering educators and administrators, as well as practicing professional engineers

Background knowledge expected of the participants

No previous knowledge is required.

Workshop Activities

Lectures, demonstrations and discussions

Workshop Time

2 hours

Presenters

Ivan Liebgott is professor at the University of Nice (France) in bachelor curriculum for Mechatronics and Mechanical Engineering. He is an engineer, and holds a masters in spacecraft engineering. His work and teaching are based on linking academia and industry needs. Author of a book about the academic use of MATLAB / Simulink and its applications in the Model Based Design workflow, he regularly conducts seminars, webinars and training about this topic for other teachers. Ivan is also responsible for recruiting engineers for the “Concours Communs Polytechniques” corporation, comprising more than 40 French engineering schools and is a fellow of the French association “Union of Professors in Sciences Technologies and Industry” (UPSTI).

Ascension Vizinho-Coutry is principal academic evangelist at MathWorks, after holding pre-sales engineering and technical management positions. From her industry and research background, her mission is to shape MathWorks product family to address modern STEM teaching methods. This workshop is the result of collaboration between teachers, inspectors and MathWorkers and presents the progression from Secondary to University levels. Ascension obtained her Ph.D degree in Applied Mathematics at the University of Sheffield and a French diploma of Engineering in Applied Mathematics, at the 'Institut National des Sciences Appliquées' in Rouen.