



Webinar Series 2021: Fast, efficient & reliable problem

A series of six webinars on different topics related to process and product engineering has been organized by PSE for SPEED. The series will consist of the following webinars: 1) 3-days workshop on sustainable chemical (and biochemical) process design; 2) a 4-hours workshop on pure component and mixture properties estimation; 3) a 3 hours workshop on refrigerant design; 4) a 3 hours workshop on different aspects of chemical substitution; 5) a 4 hours workshop on general computer aided chemical product design; 6) a 4 hours workshop on computer aided modelling. See the table below for the date and time (in CET) for the webinars.

Program for Webinar 1: Sustainable process design in 12 hierarchical steps consisting of a 3-stage methodology

Finding novel and more sustainable production systems is an important step towards addressing the grand challenges of energy, water, environment and food currently faced by modern society. Significantly better and/or new processing routes are needed to, just to name a few, convert available resources to useful products, recycle unused material, and reprocess used material, without negatively impacting sustainability of modern society. The synthesis-design of processing routes is receiving increasing attention, not only due to the scope and significance of the problems that it covers, but also because of its industrial relevance. A processing route is a combination of raw materials, a series of processing steps to convert them, and products which they can be converted to; each processing step has various alternatives in terms of processing technologies, giving rise to a superstructure of alternatives. The synthesis-design problem is formulated as a superstructure optimization problem, solved in 3-stages. Stage-1 is the synthesis stage where a preliminary processing route is identified together with interesting alternatives. Stage-2 is the design-analysis stage where a detailed design is performed on the processing route from stage-1. Analysis of the design is performed to identify process “hot-spots” that help to define targets for improvement. Stage-3 is the innovation stage, where new alternative processing routes that match the targets of improvement are identified, thereby leading to innovative and sustainable process design. The three webinars will guide the participants through the different steps of sustainable process design with the help of case studies.

Course Organization

The Webinars are being organized by the PSE for SPEED office in Bangkok, Thailand. All confirmed registered participants will be sent a link to join the Webinars. The time indicated for each lecture includes Q&A after the lecture. The problem solution lectures will be step by step demonstration of selected case studies. Selected recorded presentations will also be available to subscribers at the PSE for SPEED YouTube channel. Subscribers will also be able to download copies of the presentation slides. There will be Q&A at the end of all lectures and also in the problem sessions.

Please direct all your questions to the PSE for SPEED in Bangkok to Ms Orakotch Padungwatanaroj (P.orakotch@gmail.com).

Webinar 1.1: Process synthesis stage (14 July)

Lecture	Time (CET)	Topic	Speaker
1.1	14:00 – 15:00	Introduction to “Sustainable process design in 12 hierarchical steps consisting of a 3-stage methodology” plus brief overview on the contents of Webinar 1.1	Rafiqul Gani
1.2	15:00 – 15:30	Process groups based flowsheet synthesis with generate & test approach	Rafiqul Gani
1.3	15:30 – 16:30	Pyosyn: Advanced Computational Tools for Process Synthesis	Ignacio Grossmann*
1.4	16:30 – 17:00	Superstructure-based process synthesis, using Super-O	Rafiqul Gani
1.5	17:00 – 18:00	Problem solution using ProCAFD (process synthesis steps) software tool; Q&A	Anjan Tula; Kornkanok Udomwong

* Invited guest speaker

Webinar 1.2: Process design stage (15 July)

Lecture	Time (CET)	Topic	Speaker
2.1	14:00 – 14:30	Introduction to Process design-analysis stage (equipment design, process simulation; analysis (cost, LCA, etc.), hot-spot identification & define targets for improvements	Rafiqul Gani
2.2	14:30 – 15:30	Design of process operations and equipment using the reverse design approach	Mario R Eden*
2.3	15:30 – 16:00	Process analysis (economics, LCA)	Rafiqul Gani
2.4	16:30 – 17:00	Process analysis to identify process hot-spots and define design targets	Rafiqul Gani
2.5	17:00 – 18:00	Problem solution using ProCAFD (process design steps, including process simulation with PROII) software tool; Q&A	Anjan Tula; Kornkanok Udomwong

* Invited guest speaker

Webinar 1.3: Process innovation stage (16 July)

Lecture	Time (CET)	Topic	Speaker
3.1	14:00 – 14:30	Introduction to process innovation stage	Rafiqul Gani
3.2	14:30 – 15:30	Computer-aided process intensification	Rafiqul Gani
3.3	15:30 – 16:00	Hybrid schemes for process innovation & retrofit	Rafiqul Gani
3.4	16:00 – 17:00	Problem solution using ProCAFD (process innovation steps): software tools; stand-alone tools; Q&A	Anjan Tula; Kornkanok Udomwong
3.5	17:00 – 18:00	SYNOPSIS - Synthesis of Operable Process Intensification Systems	Stratos Pistikopoulos*

* Invited guest speaker