



ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ
ΣΧΟΛΗ ΧΗΜΙΚΩΝ ΜΗΧΑΝΙΚΩΝ

ΕΠΙΤΡΟΠΗ ΣΕΜΙΝΑΡΙΩΝ, Καθηγητής Α. Κοκόσης

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ΣΕΜΙΝΑΡΙΟ ΧΗΜΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

Τρίτη 17 Μαΐου 2011, 13:00
Αίθουσα Σεμιναρίων «Ν. Κουμούτσου»

Professor Nicolas Abatzoglou

**Department of Chemical and Biotechnological
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**Process Analytical Technology (PAT) as a new
direction in chemical engineering**

“Process analytical technologies (PAT) in the pharmaceutical industry” is a rather new field. The US Food and Drug Administration (FDA) officially adopted the PAT concept in 2001. Pharmaceutical industry requires new tools for "in-line", "on-line" or even "at-line" analysis to provide quality control at least equal to or better than the ones currently used "off-line" while substantially reducing cycle time and overall quality control costs.

An industrial research Chair in this field, established by the Université de Sherbrooke and Wyeth Montreal, now Pfizer, is aimed at facilitating the interdisciplinary interaction between the convening parties and reach significant scientific and technical advances which profit to the industry and the society more generally. This Chair partnership involves R&D and Implementation components. In the abbreviation "R&D": (a) the letter "R" concerns fundamental research on the behavior of moving powders (mixture and flow) as a function of their physicochemical properties and cohesion-adhesion forces; (b) the letter "D" represents the use of fundamental knowledge acquired in "R" as well as existing or under-development, "real-time" analytical techniques for the understanding and efficient simulation of complex processes such as the handling of particulate systems. There exist 4 types of PAT tools (PAT toolbox) to measure, understand, track, and control a process:

- Analyzers quantifying critical process (physical and mainly chemical) attributes, i.e. spectrometers analyzing mixture composition over time.
- Statistics used in the design of experiments for understanding and quantifying the influence of critical parameters and their interactions with the process.
- Process control, i.e. multivariate analysis and control strategies.
- Knowledge management and continuous improvement, i.e. mathematical models and protocols.

A PAT application is defined as a combination of two or more of these four tools to ensure proper monitoring and process control. This seminar's target is to familiarize the scientific and technical audience with this relatively novel ChemEng direction and present specific examples.