

Industrial optimization (DoE, SPC)



SCHOOL

Polytech Graduate School of
Engineering



CAMPUS

Belle-Beille



LEVEL

Engineering 4th year



OPEN TO EXCHANGE STUDENTS

Yes



SEMESTER

Fall (S1)

> **Degree course:** Quality, Innovation and Reliability Engineering

> **Teaching unit:** UE 7-2 Science and technologies

> **Course language:** English

> **Duration (hours):** 32

> **ECTS:** 2

> **Teacher(s):** Mihaela Barreau and Abdessamad Kobi

> Assessment:

Continuous assessment

Final exam

> Teaching methods:

Lecture course 14.67 hours

Tutorial course 17.33 hours

Practical work hours

Case study

Project

COURSE DESCRIPTION

Signal/noise ration and robust engineering

- Two level fractional experiments
- Optimal design of experiments
- Nonstandard Taguchi arrays
- Limits of Taguchi arrays
- SPC and other tools (RandR, DoE)
- SPC, Six sigma and robust engineering
- Control charts for complex processes - EWMA, CUSUM, FIR, small series control chart, pre-inspection chart
- Non Gaussian distribution processes
- The folded normal distribution
- Process capability index calculation

OBJECTIVES

industrial process optimization, design and use experiments, monitoring, control - and supervision of complex industrial processes, in order to reduce variability

PREREQUISITES

probability and statistics, linear algebra, design of experiments, SPC

SELECTIVE BIBLIOGRAPHY

- « La méthode des plans d'expériences », J. Goupy, Dunod, 1988
- « Conception de la qualité : les plans d'expériences », R.H. Lochner, J.E. Matar, AFNOR, 1992
- « Pratique industrielle de la méthode Taguchi », J. Alexis, AFNOR, 1995
- « Les plans d'expériences », G. Sado, MC. Sado, AFNOR, 1991
- « Design and analysis of experiments », D. C. Montgomery, Wiley, 2001 - « Design and analysis of experiments », A. Dean, D. Voss, Springer, 1999
- « Appliquer la maîtrise statistique des procédés MSP-SPC », M. Pillet, Editions d'Organisation, 2000 « Six Sigma : comment l'appliquer », M. Pillet, Eyrolles, 2013