



Doctoral school SPIM - science course 2015-2016

Acronym : SPIM-EISE	Electrical Instruments fo Science and Engineering
Required prior knowledge	It is understood that the attendee background is suitable to a PhD thesis in experimental sciences or in engineering, and that he/she has a reasonable understanding of physics and electricity.
Form of examination	Separate evaluation for attendees seriously involved in Time and frequency, and for everybody else. Contact the instructor.
Keywords	Electrical measurements, instruments, precision, accuracy, sensors, metrology
Learning outcomes	
Content	<p>See EHORIZ</p> <p>Fundamentals of measurement :</p> <ul style="list-style-type: none"> ✘ A simple measurement : transducer, reference, and comparison ✘ Precision accuracy, measurement time, signal-to-noise ratio, etc ✘ A-type and B-type uncertainty (BIPM classification) ✘ Drift, walk, influence quantities, environment, effects, correlations, etc ✘ Fundamental types of measurement : null, bridge, differential, ratio, etc ✘ Standards and references, primary, secondary, working <p>Time domain and frequency domain measurements</p> <ul style="list-style-type: none"> ✘ Fourier statistics ✘ Wavelet variances (Allan variance and similar tools) ✘ The role of the weight (taper) function <p>In depth analyses of a few instruments of ubiquitous use:</p> <ul style="list-style-type: none"> ✘ Digital multimeter (voltmeter, ammeter, ohmmeter) ✘ Digital oscilloscope ✘ Frequency counters ✘ Spectrum analyzers ✘ Power meters ✘ Lock-in amplifier
Instructor(s)	RUBIOLA Enrico (FEMTO-ST)
Number of participants	
Hours	14h (Lecture cours: 14h + Exercices: 0h + Pratique Work, TP-projet:0h)
Calendar number of sessions, dates and times	
Location (room, building, address, city)	UFC or ENSMIM Campus universitaire, Besançon
Registration Procedures	<p>by email to formations.doctorales@univ-fcomte.fr</p> <p>Your message MUST specify your Full name, graduate school, research team, the style of training and / the sessions you wish to register. If you are outside the UFC also indicate your year of thesis, the name of your home university.</p> <p>Registrations will be taken into account until three weeks before the date of formation within the limits of available seats.</p> <p>You will receive an acknowledgment of your request, then a notice by email approximately one week prior to training.</p> <p>WARNING: The courses are expensive, by registering, you agree to participate. If you are exceptionally ultimately unable to participate, be sure to inform as soon as possible.</p>
Comments	<p>Participants who have validated this course (registration at each session and validation rules as above) and who have completed the online survey will receive a certificate via email in the days / weeks following the training.</p> <p>This training is open to doctoral students from other graduate schools.</p> <p>All lectures are given in English, and all the learning material is written in English. However, the instructor understands well Italian and French.</p>

Formation non ouverte en 2015-2016
les doctorant-e-s intéressé-e-s par cette formation peuvent s'inscrire à la formation <FASO>
-> une partie des sujets de <EISE> est couverte par <FASO>
This course is not open for this year. If you are interested, you can apply and register to <FASO> training as a large part of the learning is include