

8.00 credits

38.0 h + 19.0 h

Q1



This learning unit is not open to incoming exchange students!

Teacher(s)	. SOMEBODY ;Elens Laure (coordinator) ;
Language :	English
Place of the course	Bruxelles Woluwe
Main themes	This course on modeling provides an in-depth introduction to population model building, focusing on the development of structural and variance models, objective functions, and parameter estimation methods. It covers the variability of parameters, handling censored data, and modeling informative dropout. The course addresses absorption modeling, allometric scaling, parent-metabolite modeling, TMDD (target-mediated drug disposition) modeling, immunogenicity modeling, and bioequivalence assessment. For population PK/PD modeling, it explores various effect data types, including Emax models, QT models, logistic regression, Poisson regression, Markov models, time-to-event models, and item response theory models. The course also also covers covariate modeling with selection, identification, correlation, time-varying covariates etc... Model diagnostics will also be thoroughly examined, with topics like internal versus external evaluation, bias and precision, predictive performance assessment, residual-based diagnostics, empirical Bayes estimates-based diagnostics, simulation-based diagnostics, goodness-of-fit diagnostics, covariance matrix, bootstrap, objective function mapping, log-likelihood profiling, and visual predictive checks. Finally, the course introduces software tools essential for model development and evaluation, such as NONMEM, PsN, Xpose, and Monolix.
Learning outcomes	
Evaluation methods	Practice based online evaluation during examination period The evaluation is based on a team project, for which a report will be prepared, to be submitted before the oral exam. The oral exam will take place during the examination period. At the oral exam, students will individually present and defend their project. Questions will be asked for clarification about techniques used, statements made, and conclusions drawn in the report and presentation. Project: max. score 8/20 Oral exam: max. score 12/20 The project counts for the full 8 points only if at least 6/12 is obtained on the oral exam. In case the score on the oral exam is less than 6/12, the score on the report is reduced to at most 4/8. If the score for the oral part is less than 3/12, the score for the report is reduced to at most 2/8. This is to encourage active participation in the teamwork. Timely submission of the report is a necessary condition to take part in the exam. In case the deadline has not been met, the score for this course will be NA.
Teaching methods	Interactive lecture - Presentation - Computer session
Content	The aim of this course is to gain proficiency in understanding the theory and hands-on expertise in the application of nonlinear mixed-effects methods for developing mathematical-statistical models to describe and predict pharmacokinetics, pharmacodynamics, and disease progression. Students will develop a critical understanding of the rationale behind model selection strategies and differentiation between candidate models based on quantitative and qualitative criteria. They will learn how to conduct and interpret covariate analyses and model evaluation strategies. Moreover, students will learn how to communicate modeling results effectively. • Introduction to pharmacometrics modeling • Base model development • Covariate evaluation • Model evaluation • Pharmacodynamics models • Hands on
Inline resources	Not on moodle but toledo (KULeuven platform)
Other infos	KULeuven course (K0P03)

Faculty or entity in charge	FARM
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Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Advanced master in pharmacometrics	PMTX2MC	8		