

**MI205-IS: R Programming for Pharmacometrics (2 CR)**

MI205 formerly MI220, covers introductory through intermediate-level R programming topics with a focus on pharmacometric applications through lecture and hands-on lab sessions. Topics covered include basic R language constructs, data import/export, writing scripts and functions, manipulating data objects, traditional and lattice graphics, and basic statistical methods. This course also makes extensive use of the MIfuns package to teach and implement tasks such as population PK data set assembly, postprocessing of Maximum Likelihood and Bayesian modeling output, exploratory and report-quality graphics and tables, and automation of compute intensive methods, such as bootstrapping and posterior predictive check model qualification. Participants may apply the 2 credit hours from this course to the Metrum Institute Certificate Program in Pharmacometrics.

**Instructors**

Timothy Bergsma, Ph.D., Metrum Institute  
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James Rogers, Ph.D., Metrum Institute

**Independent Study**

Metrum Institute offers Independent Study (IS) courses for students needing or preferring a more flexible training option. Access to IS courses is available by semester (Spring or Fall). Registration may be completed at any time but access to the web classroom is only granted during the next available semester. For more information, please see the [Metrum Institute Independent Study Course Policy](#).

**Prerequisites**

None

**Computer Hardware/Software**

This course requires a Windows computer with a web browser and R installed for hands-on examples.

**Fees**

Regular registration: \$2000 USD / Academic & government registration: \$1000 USD

**Course Topics**

- Basic mechanics in R
- Basic plotting (lattice – xyplot, boxplot, etc.)
- Basic function writing
- Data summary (manipulation, function application – aggregate, apply's, statistical summaries)
- More advanced plotting (xyplot with embedded functions, use of summaries in plotting)
- Data assembly – merge, imputation, random number generation, putting together a data set
- Modeling in R (lm, nlme, etc.)
- Modeling outside of R (generating NONMEM<sup>®</sup> input, reading NONMEM<sup>®</sup> and WinBUGS output, etc.)
- Advanced function writing
- Advanced exercises and hands-on examples
- Advanced data manipulation – reshape, reapply, etc.
- Advanced graphics – presentation of modeling results from bootstrap, predictive check, WinBUGS, extending lattice grid