Sample course contents

Day 1: Foundations of data analysis

- Introduction
- Value of data
- Why machine learning?
- Fitting a straight line to data
- Comparison to analytical formula for uncertainty
- Data
- Practical: manual curve-fitting
- Manual bootstrap or ‘jackknife’ procedure

Day 2: Machine learning

- Surrogate models
- Assessing accuracy
- Dealing with imperfect knowledge
- Supervised vs unsupervised learning
- Different types of machine learning
- Demo of model creation in Alchemite
- Practical

Day 3: Adaptive experimental design with ML

- What is adaptive experimental design?
- Acquisition functions
- Optimization strategies
- Choosing models and algorithms
- Practical

Day 4: Practical experimental design with Alchemite

- Multi-objective optimisation
- Putting it all together: full adaptive experimental design workflow
- Tooling overview
- Introduction to Alchemite DOE
- Trial Alchemite licenses with own data problems
- Teams present results of Alchemite models
- Wrap-up and Q&A