

**1. Summary of probability calculus**

Calculus in one dimension  
Many dimensions and correlation  
Use of the R software

**2. Statistics: estimation**

Frequentist Neyman parameter estimation  
Bayesian parameter estimation  
MC estimation  
Maximum likelihood estimation  
The R software for estimation  
Bootstrap estimation of errors and biases

**3. Statistics: hypothesis test**

Frequentist and Bayesian hypothesis test  
Likelihood ratio techniques  
MC and Bootstrap techniques  
The R software for tests  
Signal over background estimation: the Higgs and LHC cases

**4. Best Fit techniques**

Least squares algorithms  
Maximum likelihood event by event fits  
The R software for fit  
The Root MINUIT platform for fit

**5. Problem solving following the proposals of the students also**

In connection with the course *on Python-based methods and applications in physics*