

## Syllabus of Florence 2024 Short Course

### Monday

#### *Morning: Lecture*

- a. 9.00 - 10.30:
- Mixed Models (as it relates to Breeding and Genetics: VCE and EBV)

Coffee Break (10.30 - 11.00)

- b. 11.00 - 12.30:
- Introduction to BLUPF90 programs for the analyses of Mixed Models
  - Estimation of breeding values and VCE: `blupf90+`
  - Estimation of breeding values and VCE - Bayesian: `gibbsf90+`

Lunch Break (12.30 - 14.00)

#### *Afternoon: Practicum*

14.00 - 15.30:  
Practicum

Coffee Break (15.30 - 16.00)

16.00 - 17.30:  
Practicum

### Tuesday

#### *Morning: Lecture*

- a. 9.00 - 10.30:
- Genetic resemblance, diversity, and covariance
  - Introduction to genomic data

Coffee Break (10.30 - 11.00)

- b. 11.00 - 12.30:
- Theory of GBLUP and ssGBLUP
  - Creation of genomic relationship matrices and quality control in `preGSf90`
  - Using `blupf90+` and `gibbsf90+` for GBLUP and ssGBLUP

Lunch Break (12.30 - 14.00)

*Afternoon: Practicum*

14:00 - 15:00:

Practicum

Coffee Break (15.00 - 15.30)

14:00 - 15:00:

Practicum

**Wednesday**

*Morning: Lecture*

a. 9.00 - 10.30:

- Multi Environmental and Multivariate Models
- Genotype by Environment and longitudinal models

Coffee Break (10.30 - 11.00)

b. 11.00 - 12.30:

- Multivariate, random regression, and reaction norm models using `blupf90+` and `gibbsf90+`

Lunch Break (12.30 - 14.00)

*Afternoon: Practicum*

14.00 - 15.30: Practicum

Coffee Break (15.30 - 16.00)

16:00 - 7.30: Practicum

**Thursday**

*Morning: Lecture*

a. 9.00 - 10.30:

- Methods for GWAS: linear, nonlinear, and ML models
- SNP effects and GWAS from GBLUP-based models

Coffee Break (10.30 - 11.00)

b. 11.00 - 12.30:

- Multi Omics and functional Annotation

Lunch Break (12.30 14.00)

*Afternoon: Practicum*

14.00 - 15.30: Practicum

Coffee Break (15.30 16.00)

16.00 - 17.30: Practicum

## **Friday**

*Morning: Lecture*

a. 9.00 - 10.30:

- Beyond genomics, predicting phenotypes

Coffee Break (10.30 - 11.00)

b. 11.00 - 12.30:

- Practicum

Lunch Break (12.30 - 14.00)

*Afternoon: TOUR*