

Multivariate statistics short course

20-23 January 2025

Department of Animal and Dairy Science

University of Georgia

Lecturers: Alberto Cesarani, Nicolo Macciotta, and Corrado Dimauro

Structure of multivariate observations

- short recap of basic statistics (mean, standard deviation, variance, correlation)
- elements of matrix algebra
- (co)variance and correlation matrix
- eigenvectors and eigenvalues
- examples with R

Principal component analysis (PCA)

- theory
- use of PCA to reduce the dimensionality of complex dataset
- examples and practice with R

Multivariate factor analysis (MFA)

- theory
- use of MFA to study covariance in complex system
- examples and practice with R

Canonical discriminant analysis (CDA)

- theory
- use of CDA to highlight differences among groups
- examples and practice with R

Cluster analysis (CA)

- unsupervised learning
- use of CA to clustering objects together
- examples and practice with R