Course "Psychological methods, introductory and advanced statistical models"
(4 doctoral credits)

Generalized Linear Model	Mariagrazia Benassi	8	28.01.2025 (9-13) 30.01.2025 (9-13)	Cesena (Laboratorio informatica 2)
Post-hoc analysis: Do's and don'ts	Sara Garofalo	4	05.02.2025 (9-13)	Cesena (Laboratorio informatica 1)
Exploratory and confirmatory factor analysis	Sara Giovagnoli	8	07.02.2025 (14-18) 14.02.2025 (14-18)	Cesena (laboratorio informatica 2/laboratorio informatica 1)
Introduction to Structural Equation Modeling	Giulia Casu	4	21.02.2025 (14-18)	Bologna (Aula 2)
The open science revolution: why and how to	Sara Garofalo	8	28.02.2025 (9-13; 14-18)	Cesena (Aula E)

General info on the course
The course requires mandatory attendance (students must attend at least 80% of the classes). In addition to attendance, individual study and the completion of a set of assignments are required. To complete the course and earn the corresponding credits, doctoral students must attend the classes and receive a positive evaluation for each required assignment (information for each assignment will be provided during the classes). The final assessment will be pass/fail (no grade will be given).

Teaching methods
The activity will include brief lectures, discussions in the class, and practical activities.
Description of the modules

Module 1: Generalized Linear Model – Prof. Mariagrazia Benassi

Students will learn the theoretical basis and application examples of the generalized linear model using SPSS and JASP.

References

IBM SPSS (free access for Unibo Lab), JASP (free online access), Benassi, M., Bolzani, R., Forsman, L., Ådén, U., Jacobson, L., Giovagnoli, S., & Hellgren, K. (2018). Motion perception and form discrimination in extremely preterm school-aged children. *Child Development*, *89*(6), e494-e506.

Module 2: Post-hoc analysis: Do's and don'ts – Prof. Sara Garofalo

Students will learn the limits and opportunities of using post-hoc analyses, focusing on when and how to apply them effectively in research.

References
Garofalo S., Giovagnoli S., Orsoni M., Starita F. & Benassi M. (2022) Interaction effect: Are you doing the right thing? *PLoS ONE* 17(7): e0271668. https://doi.org/10.1371/journal.pone.0271668

Module 3 Exploratory and Confirmatory Factor Analysis – Prof. Sara Giovagnoli
Students will learn the theoretical basis and application examples of Exploratory and Confirmatory Factor Analysis using SPSS and JASP.

References
Giovagnoli, S., Marotta, L., Magri, S., Muccinelli, M., Albani, A., Casu, G., ... & Benassi, M. (2020). Preliminary Validation of the CI-FRA Checklist: A Simple Screening Tool for Measuring the Early Signs of Reading and Spelling Disorders in Italian Primary Students. *Frontiers in Psychology*, *11*, 516424.

Module 4: Introduction to Structural Equation Modeling – Prof. Giulia Casu

Students will learn fundamental concepts and modeling procedures in Structural Equation Modeling (SEM). Students will explore and apply SEM techniques, including SEM with observed variables, latent variables, and a combination of both within mediation models.

References

Thakkar, J.J. (2020). Structural Equation Modelling. Springer. https://doi.org/10.1007/978-981-15-3793-6_3 [CHAPTERS 2 AND 3]

Module 5: The open science revolution: why and how to – Prof. Sara Garofalo

Students will learn about about open science practices, including pre-registration and FAIR data sharing, to enhance transparency and reproducibility in research.

References
Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, *349*(6251), aac4716. DOI: 10.1126/science.aac4716

Gilbert, D. T., King, G., Pettigrew, S., & Wilson, T. D. (2016). Comment on "Estimating the reproducibility of psychological science". *Science*, *351*(6277), 1037-1037. DOI: 10.1126/science.aad7243

Chambers, C. D., & Tzavella, L. (2022). The past, present and future of Registered Reports. *Nature Human Behaviour*, *6*(1), 29-42. https://www.nature.com/articles/s41562-021-01193-7