NEOLAiA Focus Academy

Course Syllabus

Data Analytics for Inclusion & Diversity

Instructors

Coordinating HEI: University of Jaén
Partner HEI's: Bielefeld University (Germany), Örebro University (Sweden), and "Ştefan Cel Mare" University of Suceava (Romania).
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and from the partner HEIs:

To be confirmed

Overview and general data

We are immersed in an information society with a wide availability of data from different fields, making it necessary to have tools that help us to understand and use the information extracted from them in our daily lives. For instance, organizations usually collect demographic data from their employees, customers, or members to know the composition of their workforce or community. They often compare their inclusion and diversity data with industry or regional benchmarks to assess their performance relative to their peers, which helps identify improvement areas.

In particular, the statistical analysis of inclusion and diversity data is a crucial practice for organizations and institutions aiming to promote equity, fairness, and representation, which are key aspects for the NEOLAiA pillars. This analysis involves collecting, processing, and interpreting data on different aspects of diversity, such as gender, race, ethnicity, age, disability, and more. Statistical analysis can help identify the main causes of diversity and inclusion challenges, and factors such as biased hiring practices, lack of diversity in leadership, or discriminatory policies can be uncovered through data analysis. The ultimate goal of diversity and inclusion data analysis is to generate actionable insights that inform policies and strategies.

In summary, the statistical analysis of inclusion and diversity data can greatly assist organizations in identifying disparities, setting targets and taking meaningful action to foster a more inclusive and equitable environment. It is an ongoing process that requires commitment, transparency, and ethical considerations to drive positive change.

The course "Data Analytics for Inclusion & Diversity" aims to provide a specific formative program for Bachelor's and Master's students focused on the use of statistical techniques in the analysis of diversity and inclusion data.

With the support of the statistical software R, flipped classroom methodology and case studies, the program will be made more interactive, and participants' existing experiences will be shared.

In addition, the collaborative work between students from different backgrounds and the cultural activities planned will allow participants to take part in an international exchange.

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Objectives

The overall objective of this program is to highlight the significance of Statistics as a scientific tool for the critical analysis of inclusion and diversity data available from different official sources and for decision-making. To this end, the program will focus on describing and applying some basic statistical techniques for data analysis with the support of the statistical software R.
The specific objectives of the course are:

1. Identify appropriate statistical techniques and apply them to available datasets.
2. Become familiar with the statistical software R.
3. Perform basic statistical analyses on datasets and interpret the results appropriately.
4. Demonstrate an effective ability to communicate the results of a statistical analysis both in writing and orally.
5. Critically evaluate the assumptions, limitations and implications of statistical analyses.
6. Develop intercultural skills and learn to work within multidisciplinary teams.
7. Foster greater awareness of inclusion and diversity, integrating them into the learning experience.

Learning outcomes and competencies

Specific learning outcomes
Upon successful completion of this course, students will be able to:

1. Select and apply appropriate statistical techniques to effectively analyse real-world datasets.
2. Proficiently use the statistical software R for data manipulation, visualisation, and analysis.
3. Perform basic statistical analyses (e.g., descriptive statistics, hypothesis testing, and regression) and interpret the results in the context of the data.
4. Communicate the findings of statistical analyses clearly and effectively through both written reports and oral presentations.
5. Critically evaluate the assumptions, limitations, and ethical considerations of statistical analyses and the conclusions drawn.
6. Collaborate effectively in multidisciplinary and intercultural teams to address statistical challenges.
7. Promote and apply principles of inclusion and diversity in statistical practice and teamwork, and foster an equitable learning environment.

Key competencies
Students will develop the following competencies:

1. Ability to identify the most suitable statistical methods for various types of data.
2. Capacity to critically assess the quality of statistical analyses and their applicability to different contexts.
3. Proficiency in using R for data analysis.
4. Ability to interpret statistical outputs, draw logical conclusions, and understand the practical implications of analyses.
5. Capability to communicate statistical findings effectively, both orally and in writing.
6. Ability to question the validity of statistical assumptions and to recognise biases or limitations in data and analyses.
7. Skills in collaborating across cultural and disciplinary boundaries, respecting diverse perspectives, and fostering an inclusive environment in team settings.
8. Awareness of the impact of statistical methods and results on society, with a commitment to ethical practice and inclusivity.

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Outline the specific learning outcomes and competencies that students are expected to acquire upon completion of the course, aligning with the duration and ECTS requirements.
The BIP study load is 3 ECTS credits and combines both face-to-face teaching (1.5 ECTS credits) and online activities (1.5 ECTS credits).

Contents

The contents of this course are structured in 5 modules that include exploratory, descriptive and inference techniques:

Chapter 1: Introduction to statistical data analysis and first steps with R software
Chapter 2: Exploratory analysis of inclusion and diversity data using graphical and analytical methods
Chapter 3: Categorical data analytics for inclusion and diversity
Chapter 4: Inference techniques applied to inclusion and diversity data
Chapter 5: Modelling the relationship between inclusion and diversity characteristics

Number of students, profile, selection process, and registration

This BIP is open to students from Bielefeld University (Germany), Örebro University (Sweden), and "Ştefan Cel Mare" University of Suceava (Romania), as well as students enrolled at a university that is either part of the European Universities alliance, NEOLAiA, or an ERASMUS+ partner university with which the University of Jaén has an Erasmus agreement.
The BIP approach is eminently practical with the support of statistical software tools, so we hope that it will be enjoyable and useful for everyone. The only academic prerequisites are elementary knowledge of mathematics and basic computer skills.
Therefore, the BIP is open to students from any academic level (Bachelor, Master, PhD), with a critical mind, a passion for understanding the role of statistics in today's world, and an eagerness to learn about statistical data processing.
Furthermore, since the language of instruction is English, students are expected to have sufficient language proficiency to keep up with the course.
The estimated number of students taking part in the BIP is 15-20 international students plus 3-5 students from the University of Jaén. Each partner HEIs can nominate up to 10 students. First, each participating university will select its international students locally and rank them based on their grades or ECTS points. Then, the final selection of students will be determined by the University of Jaén, taking into account the rankings provided by all participating universities and available spots.

Activities

The BIP will take the form of project work, in transnational teams, based on the statistical analysis of inclusion and diversity data.
The program framework consists of:

- Face-to-face teaching (June 8-12, 2026), at the University of Jaén, including:
  - Lecture time
  - Cultural and social activities.
- Online activities (June 15-19, 2026), including:
  - Asynchronous activities (watching videos, reading scientific texts, self-assessment tests, etc.)
  - Student work (project tasks, teamwork, poster presentation)
  - Webinars (student presentations, discussion, conclusions)
  - Guest lectures

The asynchronous activities (watching videos, reading scientific texts, etc.) will be open to the wider community (students, staff, and faculty).

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Calendar/program

Please refer to the following website for the course schedule.
Link to be confirmed

Assessment

The following assessment methods and criteria will be used to evaluate student performance:

- Attendance and active participation in face-to-face sessions: relative weight 70%. June 8-12, 2026.
- Online activities (self-assessment tests, active participation): relative weight 30%. June 15-19, 2026.

Final grades for this course will be based on the institutional grading scales used at UJA: https://www.ujaen.es/internacional/sites/segundonivel_internacional/files/uploads/documentacion/pdf/informacion-academica/institutional_grade_scale.pdf

Additional comments

For further information about the course, please visit the following website:
Link to be confirmed

Students will receive grades and course certificates in accordance with UJA University's standard procedures.

References

1. C. Heumann, M. Schomaker, Shalabh (2023). Introduction to Statistics and Data Analysis: With Exercises, Solutions and Applications in R. 2nd ed., Springer Nature.
2. P. Dalgaard (2008). Introductory Statistics with R. Springer, New York.
3. J.F. Wiley, L.A. Pace (2015). Beginning R: An Introduction to Statistical Programming. 2nd ed., Apress, USA.
4. R. Schumacher, S. Tomek (2013). Understanding Statistics Using R. Springer.
5. P. Newbold, W.L. Carlson, B. Thorne (2022). Statistics for Business and Economics. 10th ed., Pearson Education.
6. S. Ross (2010). Introductory Statistics. 3rd ed, Academic Press/Elsevier.

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