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Learning Outcomes of the EMOS programmes

I. Programme Profile

EMOS aims at providing students with an advanced training in the specific themes of statistics in general and official statistics in particular, supported by the complementary quantitative and statistical tools offered by the hosting university. The main objective of EMOS is to enhance the abilities of students to understand and to be able to analyse European official data at different levels: quality, production process, dissemination, and analysis in a national, European and international context.

This range of skills represents the ideal foundation for the development of professionals able to interpret the fast-changing official data production system of the 21st century. This is why it is important that the EMOS learning outcomes are included in a degree designed for students aiming at economical/social/statistical knowledge-intensive careers. It contributes to offer a solid foundation for those willing to pursue a preparation in the field of data collection on societal and economic facts or other professional activities characterised by a strong need for awareness about the development, production and dissemination as well as use of official statistics.

II. Learning Outcomes

Graduates who have successfully completed an EMOS programme will be able to demonstrate knowledge about:

1) The system of official statistics

a. To be aware of the importance of official statistics as basis for data-driven policy decision making;

b. To master the organisation and role of the European Statistical System (ESS), the European System of Central Banks (ESCB) and other official data producers and their legal bases, including those referring to data confidentiality;

c. To be aware of the main institutions operating at national and international level and their data sources (e.g. Eurostat, ECB, IMF, ILO, BIS, UN, OECD, World Bank);

d. To understand the principles of the European Statistics Code of Practice (for the ESS)[1] and the Public Commitment (for the ESCB) and how they apply to the different steps of data production and dissemination.

[1] Laid down in Regulation (EC) No 223/2009 as amended as well as Council Regulation (EC) No 2533/98.

2) Production models and methods

a. To understand and be able to use different kinds of data sources for statistical production, especially censuses, survey data, administrative sources, big data as well as to evaluate pros and cons of each data source (impact on the main quality dimensions of the results);

b. To be able to design and manage data production processes, including the definition of the main dimensions of quality and how to monitor and evaluate them;

c. To be aware of different production models, including the enterprise architecture concepts applied to official statistics (e.g. metadata management, Generic Statistical Business Process Model, data archiving, standard statistical units, mixed-device surveys, statistical classification);

3) Themes in official statistics

a. To be able to understand methodological issues related to the statistical domains such as economy and finance, population and social conditions, industry, trade and services, agriculture and fisheries, international trade, transport, environment and energy, science and technology, general and regional statistics, sustainable development goals;

b. To be able to apply methods suitable to produce and analyse data in these fields;

4) Statistical Methods

a. Knowledge of and ability to apply statistical methods such as sampling, small area estimation, non-response adjustments, editing and imputation, validation, treatment of big data, time series analyses, seasonal adjustment, outlier treatment, index theory, multivariate statistics, econometrics, spatial statistics, knowing the concepts of metadata, paradata, data integration, critical capacity of framing analysis of statistical data;

b. Understand statistical confidentiality issues in the production as well as dissemination of official statistics and the main methods to ensure it (i.e. privacy-preserving computation, statistical disclosure control)

c. User experience and programming capacities enabling to find professional solutions to complex data processing tasks, e.g. with tools such as R, Python , SAS, SPSS or STATA;

5) Dissemination

a. Ability to present data in an effective way to different kinds of audience using different types of state-of-the-art communication channels including social media;

b. Understanding and actively handling the most important tools available for data and metadata dissemination and presentation of results, such as tables, charts in a static and dynamic web-based environment, data warehouses, advanced visual graphics, etc.

c. To be familiar with different disseminated data e.g. linked open data, infographics and experimental statistics.