



Syllabus of the UN-Data Analytics Professional Certificate

UN-DAPC- Spring Semester

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Learning outcomes

The UN DAPC offers a unique blended curriculum on descriptive and predictive analytics in the UN context. Over six months, participants are guided through a specialized learning built by UN data experts.

The programme has been designed to prepare UN staff to unlock their data potential through a comprehensive and interactive overview of core data science concepts from descriptive to predictive analytics. Participants will be better equipped to formulate problem statements for data informed solutions, apply data visualization and storytelling design principles to deliver powerful message, and build basic predictive models with appropriate methods and skills. They will have the opportunity to hone their skills in effectively communicating data analysis findings and dealing with the ethical dilemmas and risks associated with working with real-world data cases. At the end of the Programme, participants will be able to:

- Explain the different types of analytics and their applications in the UN context
- Implement a scoped data analysis to their needs for information

- Use data visualization and storytelling techniques to communicate key messages
- Identify suitable predictive analytics applications to meet the business needs at their workplaces
- Describe the key features of predictive models, understand risks and how to ensure an ethical use.

It is composed of self-paced lessons and instructor led webinars. Practical case studies and on the job practice opportunities are key features of this course. The features ensure that participants not only gain solid knowledge and skills but also apply them.

The UN DAPC offers a number of learning modalities that give participants a unique opportunity to learn by doing through a data-use case approach.

Target audience

The course targets UN personnel (professional and general service staff) at headquarters and field locations, interested in using data more effectively at work. It will be of great benefit to those who need to present analyses or to those charged with research, analytical and reporting responsibilities. More in general, the course will benefit all UN staff interested in expanding their knowledge and ability to access, use, interpret and communicate data.

Thematic self-paced modules

A comprehensive curricula of thematic self-paced modules delivered online through UNSSC's e-learning platform. More information on the 10 thematic modules is displayed below:

Module 1 Data fundamentals

This module lays the foundation of data science. It describes the main elements and characteristics of data and the importance of data for the United Nations. Meanwhile, it introduces descriptive statistical measures that can help us understand the quality of our data.

Module 2 Data science project

This module offers an overview of a data science project. We explore the management components of a data science project, and identify different types of approaches to data analysis. And then, we analyze different methods for data sampling and data collection to get high-quality data for analysis.

Module 3 Data exploration and analysis

This module guides us to the core steps of a data science project: data preparation and data analysis. We discuss the processes of data cleaning and the measures for data protection. Also, we cover the concepts and skills of data analysis and statistical models with EXCEL examples.

Module 4 Data for decision making

This module explains the use of data analysis results in the decision-making process. We establish the processes of turning data into wisdom, and at the same time, understand biases and noisy environments interrupt thoughtful data decisions. From here, we explore the efforts conducted to move towards data-driven organizations.

Module 5 Data visualization- Part 1

This module reveals the basics of data visualization. Starting from the concepts and theories, we learn to communicate with data and explore the scenarios for different visualization types. By analyzing some particular examples, we identify practices that misuse data and manipulate the information, as well as skills to make accessible data visualizations.

Module 6 Data visualization- Part 2

This module extends the data visualization to the advanced level. We refine our graphs from a design standpoint to ensure the message is clear and well-emphasized. Then, we learn how to interpret more advanced graph types, as well as when to use them.

Module 7 Data storytelling

This module incorporates data into storytelling to deliver an engaging and credible message. We explore how to leverage data storytelling concepts and approaches to enable decision-making. Following the traditional narrative arc, we consider the context, the message, and the interactivity to build a powerful data story.

Module 8 Fundamentals of predictive analytics

This module introduces the key concepts and features of predictive analytics. From its mathematical logic to various methods, we learn the fundamentals of predictive analytics and the procedures for developing a predictive model. With real-life examples, we examine different kinds of predictive models for suitable scenarios in social sciences.

Module 9 The science of predictive analytics

This module describes common approaches of predictive analytics. First, we learn the components and functions of time series and learn how to develop one. Second, we analyze the methods of machine learning and its application. Third, we explore how to use ensemble learning to build a high-quality predictive model.

Module 10 Applying predictive analytics

This module demonstrates the process of machine learning model deployment and the ethical use of predictive analytics. We learn the main steps and identify key arrangements to deploy predictive models from production to operation. Also, we discuss key considerations of ethics and risks in applying predictive models, and summarize good practice.

All self-thematic modules include a resource section with relevant materials to read. Each self-paced module takes about 4 hours to complete.

Live webinars

Practical and interactive live webinar sessions with practitioners and data experts. Information about the topics, duration and dates is displayed below.

Live session	Time	Date
Orientation webinar	60 min	4 April
Data collection and cleaning	120 min	6 April
Data exploration and analysis	120 min	13 April
Cognitive bias and logical fallacies	120 min	20 April
Data Visualization 1	120 min	27 April
Data Visualization 2	120 min	4 May
Data Storytelling	120 min	11 May
Orientation and tools to predictive modeling	120 min	23 May
Predictive analysis of malaria prevalence	120 min	25 May
Conflict prevention through classification analysis	120 min	1 June
Analysis of time series forecasting	120 min	8 June

On the job practice

Mentoring sessions will guide the application of the knowledge and newly acquired skills.

On the Job Project

The On the Job Project (OJP) is expected to summarize the skills and knowledge gained through the training directly applicable to the learners' work.

The learner should choose one of the following areas of specialization:

- 1) Data preparation, exploration and analysis
- 2) Data visualization and storytelling

By end March the learner should choose their specialization and inform the UNSSC Team, so he/she will be assigned to a mentor. The mentor and mentee will meet in 2 occasions for up to 45 minutes.

The first meeting between mentor and mentee takes place in April. The purpose of the meeting is to discuss potential options for the OJP, and guide the learner on the OJP proposal.

The OJP proposal (1-2 pages) will include:

- 1) A title and brief description of the proposed project, in one of the three areas of specialization
- 2) A brief statement of expected results
- 3) Specification of methods and tools to use

By end April the learner should submit the OJP proposal to the mentor, after the first session.

The mentor should provide written feedback on the proposal or alternatively, set up a meeting.

By 15 June, the learner should submit a brief OJP report documenting the project experience and the results obtained.

The OJP report (3-4 pages) will include:

- 1) Summary of the work conducted
- 2) Examples of analysis or visualizations used
- 3) A brief statement of conclusions

By 30 June the mentor should provide brief written feedback and have a meeting with the mentee.

Case Study

For those learners that do not work with data, or prefer to work on a given Case Study (CS), they will be asked to choose one of the following areas of specialization:

- 1) Data preparation, exploration and analysis
- 2) Data visualization and storytelling
- 3) Predictive modeling

By Mid-April the learner should inform the UNSSC Team the area of interest, and he/she will be assigned to a case-study mentor. The mentor and the group of learners in this area of specialization will meet in 2 occasions for up to 60 minutes.

The first meeting between mentor and the group will take place in April. The purpose of the meeting is to discuss potential options for the given Case Study that the mentee will receive in advanced to the meeting, and guide the learners on the Case Study proposal.

The CS proposal (1-2 pages) will include:

- 1) A title and brief description of the proposed project, in one of the three areas of specialization
- 2) A brief statement of expected results
- 3) Specification of methods and tools to use

By end April the learner should submit the CS proposal to the mentor, after the first session.

The mentor should provide written feedback on the proposal or alternatively, set up a meeting.

By 15 June, the learner should submit a brief CS report documenting the job experience and the results obtained.

The CS report (3-4 pages) will include:

- 1) Summary of the work conducted

- 2) Examples of analysis or visualizations used
- 3) A brief summary of conclusions

By 30 June the mentor should provide brief written feedback and have a meeting with the group.

Tools

The self-paced modules are mainly tool agnostic, as they focus on principles and concepts that can be used by any tool. During the webinars, the learners will discuss and practice with different tools, including:

- 1) Excel, OpenRefine, Trifacta Wrangler, WinPur and Snowflake
- 2) Flourish, Tableau, Power BI, ChatGPT
- 3) BigML and Google AI

During the OJP or CS, participants will be able to practice with the tools discussed during the webinars or others, in coordination with the mentors.

Completion requirements

The UN DAPC will be issued upon successful completion of mandatory activities, final quiz and OJP/CS positive assessment. To receive the Certificate, the learners should have:

- Completed all lessons in the Modules
- Responded to the questions in the discussion forums
- Joined all live webinars
- Completed a final test
- Submitted the OJP/CS report
- Answered a final survey about the course

Digital certification

A digital certificate will be issued as indicator of accomplishment of the acquired learning. It will be possible to display and verify the certificate online following open badge standards.

Faculty

- [Rebeca Pop](#)
- [Katerina Tsetsura](#)
- [Tarek Azzam](#)
- [Jaume Manero](#)
- [Demetrio Barragan](#)
- [Rose Barranco](#)
- [Itziar Arispe](#)