THE 2026 WCO BACUDA SCHOLARSHIP PROGRAMME (DATA ANALYTICS)

Offering a three-month offline programme to Customs officials of Member Customs administrations for in-depth study and training in Customs-related data analytics.

I. OVERVIEW OF THE PROGRAMME

This is a three-month, non-degree programme: conducted on site. The aim of this programme is to enhance the capacity of Customs officials in the area of data analysis. Data analysis is a tool that has been used by companies and governments for years in their business, to drive priority-setting, decision-making, performance measurement, budget planning and forecasting, and operations. Customs has a substantial amount of data at its disposal, beginning with data submitted for the Customs clearance process. Thanks to the development of digital technology, Customs can tap into data from other government agencies, commercially available databases, and open-source information platforms, such as digitized global public records and multilingual news sources.

The framework of the programme includes:

- Fundamentals of Big Data Analytics
- Machine Learning Fundamentals
- Python Programming
- Applied Advanced Analytics
- Data Technology
- WCO BACUDA Algorithm
- WCO Topics, including Data Strategy and Policy for Members.

II. SELECTION OF PARTICIPANTS

1. The number of participants in the programme will be twelve (12). Given the objectives of the programme, they should be working-level officials of Customs administrations in developing countries.
2. The candidates should be in good health and with good communication skills.
3. Officials who apply for the Programme must meet all of the following requirements: (1) Completion of the Data Analytics - Beginners Course on WCO CLiKC!; (2) At least two years of experience working in Customs Data Analytics; (3) Proof of English proficiency (both speaking and listening).

III. FUNDING

The programme will be financed through CCF-Korea, funded by the Korea Customs Service. The fund will cover travel costs, admission fees, tuition fees, institutional costs, accommodation costs, daily expenses (per diem) and other approved incidental expenses (e.g., visa fee), to enable the participants to complete the programme.

IV. PROGRAMME SCHEDULE AND DESCRIPTION

1. Course Description

The programme consists of offline courses/activities, divided into the following modules:

1) Programming with Python for Customs Applications
2) Introduction to Data Science
3) Data Collection and Cleaning in Customs
4) Data Visualization and Dashboards for Trade Insights
5) Applied Statistics and Probability in Customs Analytics
6) Machine Learning for Risk Profiling and Anomaly Detection
7) International Customs Trends
8) Natural Language Processing for Customs Texts
9) WCO BACUDA models

2. Curricular Module

At the end of the programme, each participant must submit to the University a research paper on a Customs topic concerning analytic model development, making the full and best use of the knowledge and insights gained from the programme. The research paper must be validated by the participant's tutor and must demonstrate the participant's analytical skills, understanding of the topics and discussions from the programme, and his/her strategic ability and skills. Below are the modules, which are subject to changes that will be made known to participants in due course.

Module 1	Programming with Python for Customs Applications
1	Introduction to Python for Data Processing
2	Core Python Programming Fundamentals
3	Object-Oriented Programming (OOP) in Python

4	Working with Files (CSV, JSON, XML)
5	Data Manipulation Using Pandas and NumPy
6	Error Handling and Debugging Strategies
7	Practical Project

Module 2	**Introduction to Data Science**
1	Overview of the Data Science
2	Frequent Pattern Mining
3	Decision tree and random forest
4	Basics of AI and ML
5	Exploratory Data Analysis (EDA) Fundamentals

Module 3	**Data Collection and Cleaning in Customs**
1	Extract-Transform-Load (ETL) Processes
2	Dealing with Missing, Duplicate, and Noisy Data
3	Feature Engineering for Customs Data
4	Data Integration from Multiple Sources
5	Data Quality Metrics
6	Practical Project

Module 4	**Data Visualization and Dashboards for Trade Insights**
1	Data Visualization Principles
2	Visualizing Trade Data Patterns
3	Visualization Tools and Libraries
4	Visual Storytelling for Customs Investigations

Module 5	**Applied Statistics and Probability in Customs Analytics**
1	Descriptive Statistics
2	Distributions and Percentiles
3	Hypothesis Testing in Trade Volumes
4	Correlation vs. Causation
5	Sampling Techniques for Inspection Planning
6	Bayes' Theorem in Risk Modelling
7	Practical Project

Module 6	Machine Learning for Risk Profiling and Anomaly Detection
1	Introduction to Machine Learning for Customs Analysis
2	Supervised vs. Unsupervised Learning
3	Classification Models for Risk Detection
4	Clustering Techniques for Anomaly Detection
5	Handling Imbalanced Datasets
6	Evaluation Metrics and Model Validation
7	Practical Project

Module 7	Understanding Customs in Global Trade
1	Customs Procedures and Modernization, Tariff Systems and Customs Valuation
2	Data in Customs
3	Case Studies and Global Best Practices

Module 8	Natural Language Processing for Customs Texts
1	Text Preprocessing
2	Text Vectorization Techniques
3	Named Entity Recognition (NER) for Trade Documents
4	Classification Using Textual Data
5	Pattern Extraction with Regular Expressions
6	Practical Project
Module 9	**BACUDA Algorithm**
1	Introduction to BACUDA Algorithm
2	BACUDA Algorithm: fraud detection (Lite-Date)
3	BACUDA Algorithm: HS code recommandation (AI-HS)
4	BACUDA algorithm review

3. Programme Schedule

- **All schedules are provisional and subject to change** *(Please see detailed programme in excel file, Preliminary curriculum)*
- **Best Practice on Data Analytics will be presented by each participant during the face-to-face classes, to share ideas and receive insights from classmates and professors.**
- **Classes will be organized by HYU in cooperation with the WCO and the KCS.**

V. Participants' main responsibilities

To improve their analytic capacities and develop analytic model throughout the course, selected participants are expected to work together with other fellow participants in a separate group.

They are invited to receive an orientation session from the training academy at the beginning of the course to select a topic for each group project and undertake study on an assigned topic jointly agreed within participants in cooperation with tutors from the academy and the HYU.

- A report to evaluate his/her performance and outcome of the course should be written by individual trainee (or each group) and submitted to the WCO and the HYU.
- Reporting should be made twice for the whole course, which consists of a Mid-term progress report and a final report. Necessary templates and detailed instructions for this task will be informed by the HYU during the orientation.
- Mid-term report should be submitted within one month after the opening and final report should be submitted before closing ceremony. The report will be uploaded onto the BACUDA Website, https://bacuda.wcoomd.org where appropriate.

Annex 1. BACUDA Scholarship Syllabus

Subject	Hours	Head Professor	Affiliation
• Welcome remark / Orientation	3	Eul Gyu Im	WCO/HYU
• Invited Talk	2	TBD	KCS
• Korean Language	10	TBD	HYU
• Programming with Python for Customs Applications	18	Donghyeon Cho	HYU
• Introduction to Data Science	18	Dong-Kyu Chae	HYU
• Data Visualization and Dashboards for Trade Insights	18	Sang-Yong Tom Lee	HYU
• Data Collection and Cleaning in Customs	18	Yeongpil Cho	HYU
• Applied Statistics and Probability in Customs Analytics	18	Sungshin Kim	HYU
• Machine Learning for Risk Profiling and Anomaly Detection	18	Dong-Kyu Chae	HYU
• Understanding Customs in Global Trade	12	Yang Shen	HYU
• Natural Language Processing for Customs Texts	18	Kyungsik Han	HYU
• Capstone Projects	35	Heejing Park	HYU
• BACUDA Algorithm	20	TBD	WCO
Total	**208**		