**Masters in Data Analytics**

**Duration 12 Months**

**ECTS 60 Credits**

**About the Program**

The **Master in Data Analysis** is a comprehensive and practice-oriented postgraduate program designed to equip students with advanced analytical, technical, and research skills essential for interpreting complex data and driving informed decision-making. The program offers a balanced mix of foundational tools, applied technologies, and real-world experience, spanning two semesters.

This program is ideal for aspiring data analysts, business intelligence professionals, and researchers looking to build a robust foundation in data analysis along with hands-on project experience and industry immersion.

**Program Highlights**

* Hands-on Learning: Master Excel, SQL, Python, Power BI, and Tableau through real-world applications.
* Project-Based Curriculum: Apply skills in a capstone project, research work, and thesis.
* Industry Exposure: Gain practical experience through a structured internship program.
* Data Storytelling: Build interactive dashboards and visualizations to communicate insights.
* Career-Ready Skills: Designed to prepare students for roles in data analysis and business intelligence.

**Program Benefits**

✅ In-Demand Technical Skills: Proficiency in Python, SQL, Excel, Power BI, and Tableau—highly valued by employers.

🧠 Analytical & Problem-Solving Skills: Ability to clean, analyze, interpret, and visualize complex data to support decision-making.

🎓 Research & Academic Development: Experience in structured research, thesis writing, and presenting data-driven findings.

💼 Real-World Experience: Internship and projects offer hands-on industry exposure and practical application of skills.

📈 Career Advancement: Opens pathways to roles such as Data Analyst, BI Analyst, Research Analyst, and more.

🧰 Portfolio of Work: Build a strong portfolio through projects, dashboards, and a completed thesis—showcasing your capabilities to employers.

🌐 Holistic Learning: Balanced focus on technical tools, critical thinking, communication, and industry relevance.

**Learning with Tools**

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| Tool | Key Skills Covered |
| Excel (Advanced) | - Power Query & Power Pivot  - PivotTables & Dashboards  - Solver, What-If Analysis |
| SQL | - Data extraction & joins  - Subqueries & CTEs  - Window functions & optimization |
| Python | - NumPy & Pandas for data analysis  - Matplotlib & Seaborn for visualization  - EDA & basic statistics |
| Power BI | - Data modeling & transformation  - DAX calculations  - Interactive dashboards |
| Tableau | - Data visualization & storytelling  - Advanced charts & maps  - LOD expressions |

**Learning Outcomes**

* Use Excel, SQL, Python, Power BI, and Tableau for data analysis
* Clean, transform, and manage various types of data
* Perform exploratory and statistical analysis
* Build interactive dashboards and visual reports
* Write and run complex SQL queries
* Plan and complete data analysis projects and research
* Solve real-world business problems using data
* Present clear, data-driven insights and reports

**Projects Overview**

📊 Data Cleaning & Visualization Projects

Work with raw datasets to clean, format, and visualize data using Excel, Python, Power BI, or Tableau.

Example: Cleaning survey data and creating interactive dashboards.

🔍 SQL-Based Data Exploration Projects: Use SQL to query databases, perform aggregations, and extract insights.

Example: Analyzing customer purchase patterns from a retail database.

🐍 Python EDA & Statistical Analysis: Perform Exploratory Data Analysis using Pandas, NumPy, and Seaborn.

Example: Analyzing healthcare or financial data for trends and anomalies.

📈 Business Intelligence Dashboards: Build interactive dashboards with Power BI and Tableau to support business decisions.

Example: Sales performance dashboard for a fictional company.

📚 Capstone Data Analysis Project: End-to-end analysis project: data sourcing, cleaning, modeling, visualization, and reporting.

Example: Analyzing public datasets (e.g., COVID-19, stock market, or traffic data) for actionable insights.

📝 Thesis Project: In-depth academic research involving methodology design, statistical analysis, and formal thesis writing.

Example: Studying the impact of marketing campaigns on customer behavior using real or simulated data.

💼 Internship Project: Real-world project during the internship phase in collaboration with an industry partner.

Example: Automating reporting processes or customer segmentation for a business.

Types of Projects (Please refer to page below and go to projects section for understanding)

Reference <https://www.careerera.com/data-science/master-of-science-in-data-science-by-birchwood-university>

Who should do this course

https://www.careerera.com/data-science/master-of-science-in-data-science-by-birchwood-university

**Course Curriculum:**

**Semester 1 Syllabus**

| **Course** | **Topics Covered** |
| --- | --- |
| **Advanced Excel for Data Analysis** | - Data cleaning and preparation - Functions: VLOOKUP, HLOOKUP, INDEX-MATCH, IF, nested formulas - PivotTables and PivotCharts - Data validation and conditional formatting - Power Query and Power Pivot - What-If Analysis, Goal Seek, Solver - Dashboard creation using Excel |
| **SQL for Data Analysis** | - Introduction to RDBMS and SQL - Data types and constraints - SELECT, WHERE, GROUP BY, HAVING - JOINs (INNER, LEFT, RIGHT, FULL) - Subqueries and Common Table Expressions (CTEs) - Window functions (RANK, ROW\_NUMBER, etc.) - Data manipulation: INSERT, UPDATE, DELETE - Basic performance optimization techniques |
| **Python for Data Analysis** | - Python basics: variables, data types, loops, functions - Data analysis libraries: NumPy, Pandas - Data visualization: Matplotlib, Seaborn - Data wrangling and cleaning - Handling missing data - Exploratory Data Analysis (EDA)  - Intro to statistical analysis in Python |
| **Power BI for Data Analysis** | - Power BI interface and data loading - Data transformation with Power Query - Data modeling and relationships - DAX basics and calculated columns/measures - Creating interactive dashboards - Publishing and sharing reports - Power BI Service and Power BI Gateway |
| **Tableau for Data Visualization** | - Tableau interface and data connection - Data preparation and blending - Charts: bar, line, area, scatter, maps - Filters, parameters, calculated fields - Dashboards and storytelling - Level of detail (LOD) expressions - Publishing to Tableau Server/Public |

**Summary: Semester 2 Overview**

| **Course/Activity** | **Topics Covered** |
| --- | --- |
| **Research Work** | Research methodology, data collection, statistical tools, writing & reporting, academic presentation skills |
| **Data Analysis Project** | Project selection, data collection, data analysis & modeling, project documentation, final presentation |
| **Thesis** | Topic selection, literature review, methodology, data analysis, thesis writing, thesis defense |
| **Internship** | Practical industry experience, hands-on data analysis, report writing, industry exposure, internship presentation |