

# Data Science I (11.08100) (2021)

Adopted 2021

**Demonstrate how Data Science can be used to impact school, work, and leisure time** DS1-1

1. Demonstrate how data science impacts their lives. DS1-1.1
2. Identify and differentiate between different data governance standards. DS1-1.2
3. Identify ethical issues in data science. DS1-1.3
4. Give examples of how Data Science is used in the real world DS1-1.4
5. Identify and compare potential bias issues in data science DS1-1.5

**Explore, research, and present findings on data science careers** DS1-2

1. Research post-secondary options for data science careers, including industry certifications, college options and organizational training. DS1-2.1
2. Identify and distinguish different skills sets used in data science DS1-2.2
3. Identify different job opportunities within the data science field and how such job types are interrelated DS1-2.3

**Formulate Questions to Clarify the problem at hand and formulate 1 or more questions that can be answered with data analysis** DS1-3

1. Identify the objectives of data and information management DS1-3.1
2. Determine whether a problem involves categorical or quantitative data DS1-3.2
3. Frame a statistical question of interest in terms of measurable data DS1-3.3

**Design and implement a plan to collect appropriate data to answer a research question** DS1-4

1. Define "spreadsheet" and "database" and describe ways they may be used. DS1-4.1
2. Describe the factors that must be considered in distributing data effectively and how a simple model can be used to obtain at least a first-cut distribution DS1-4.2

**Analyze data by selecting appropriate graphical and numerical methods** DS1-5

1. Implement spreadsheet functions (i.e., preset formulas), formulas, conditional formatting, cell referencing, and pivot tables. DS1-5.1

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**2. Create data tables and graphical representations of data including two-way tables, scatterplots, bar graphs, histograms, stem plots and dot plots from a spreadsheet software.** DS1-5.2

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**3. Describe the characteristics of data tables and how they benefit end user experiences** DS1-5.3

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**Identify the general concepts of databases/data tools and how to utilize design thinking to produce solutions that are clean and thoughtful.** DS1-6

**1. Identify and distinguish between variations of techniques (Artificial Intelligence, Machine Learning, etc.)** DS1-6.1

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**2. Provide definitions of key terms and concepts that describe the database environment** DS1-6.2

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**3. Describe and build the major components of the database environment and explain how these components interact with each other** DS1-6.3

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**4. Assess end user data and information requirements and develop a logical model to fit those requirements** DS1-6.4

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**Build a database based on designed model, identify implementation policies and procedures, and establish plans for testing/debugging a data science solution.** DS1-7

**1. Describe a Database Management System Language (DMBS) like SQL and summarize its basic operators.** DS1-7.1

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**2. Formulate single table DMBS (SQL) queries.** DS1-7.2

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**3. Formulate DMBS (SQL) queries that use functions.** DS1-7.3

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**4. Use of the group by and order by clauses in DMBS (SQL) queries** DS1-7.4

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**Deploy a data science solution in a production environment, follow implementation procedures, and develop a plan for long term maintenance.** DS1-8

**1. Describe the differences between the process of deployment and implementation of a solution.** DS1-8.1

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**2. Understand the components and key steps to a successful deployment** DS1-8.2

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**DS1-9. Analyze results by interpreting the information provided by the data analysis and how its interpretation supports possible answers to the question or problem being investigated.** DS1-9

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**1. Utilize visual reporting and statistic tools to perform 1 and 2 sample t-tests and linear regression testing using technology (not by hand)** DS1-9.1

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**2. Summarize results.** DS1-9.2

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**3. Identify and express areas for further study or investigation based on the analysis of data** DS1-9.3

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**4. Create a simple dashboard with appropriate tables and charts to show the data that is being analyzed** DS1-9.4

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