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## DSPA Certificate Requirements

- Certificate seekers must inform their academic advisor and schedule a meeting with the DSPA Certificate Coordinator to discuss their plan to pursue the Certificate. It is recommended that students have *at least two semesters of study remaining* when they decide to pursue the DSPA certificate.
- Demonstration of four skill competencies:
  1. **Modern Software Platform:** Utilization of one or more modern data science software platforms (Python, RStudio, STATA, Tableau, TensorFlow). MS Excel by itself will not meet this requirement.
  2. **Statistical/Machine Learning Methods:** Application of statistical models and/or machine learning methods to analyze empirical data sets using listed software platforms.
  3. **Processing Datasets:** Current methods of acquiring, merging, cleaning multiple raw data sets. Principled methods of handling outlier, missing, and/or inaccurate data.
  4. **Data Summary & Visualizations:** Creating compelling, effective data visualizations and summaries of large-scale tabular datasets.
- Completion of three DSPA-approved courses\*\* (see approved courses in table below)
- Individual data science project (DSP) using data science tools applied to real-world empirical datasets that demonstrate proficiency in the four skill competencies described above.

Some admissible project types include:

- o Professional Report (PR) – this can count toward one of the required courses (PA398R) and requires a faculty advisor
- o Individual Data Science Project (DSP)
- o Master’s thesis (for dual degree students)
- o Policy Research Projects (PRPs) and individual conference courses – must be approved by DSPA certificate coordinator and entail *sufficient individual* contribution to a group project.

## \*\*DSPA-Approved Courses

Other data science courses can be counted (requires approval from DSPA certificate coordinator)

				Certificate Skill Competencies			
	Course No.	Section Name	Faculty	1) Modern Software Platform	2) Statistical/ ML Methods	3) Processing Datasets	4) Data Sum & Viz
<b>Fall 2022</b>	PA398R (contact OSAA to enroll)	Professional Report	Your Faculty Advisor	X	X	X	X
	PA390C (60965)	Advanced Research Methods	Greitens, Sheena		X	X	X
	PA388K (60900)	Geo Info Sys (GIS) for Public Policy	TBD	X		X	X
	PA388K (60864)	Intro Vis Comm/GIS Policy	TBD	X		X	X
	PA397C (61080)	Statistical Analysis/ Learning	Rai, Varun	X	X	X	X
	PA397G (61085)	Analytical Methods for Global Pol Study	Ma, Ji	X	X	X	X
	PA397C (61070)	Program Eval for Social Impact	Bixler, Patrick	X		X	X
	PA397 (61055/61060)	Intro to Empirical Methods (IEM)	Von Hippel, Paul	X		X	X

## Individual Data Science Project (DSP) Guidelines & Parameters

Note that there is no singular way to conduct an individual data science project (DSP). There are multiple ways to apply the above mentioned four skill competencies. However, outlined below are some guiding parameters for the final project output. Students should discuss their research projects with the DSPA certificate coordinator and their faculty advisors to assure sufficient application of the skill sets and project quality.

### Parameter 1: Quantifiable policy research question and/or hypothesis

- Start with reviewing existing research literature related to your topic (keep track of these resources as they might become sources in your written report).
- Policy questions should be relevant and must include a quantifiable element to be analyzed with statistical analysis and/or machine learning methods.

Past research questions/hypotheses examples:

- Democratic donor countries decrease foreign aid to recipient countries after a democracy protest because the democracy protests signal that the country is politically unstable and experiencing democratic backsliding. [[Full report by Mackenzie Sanderson](#)]
- Is EV charging infrastructure a public necessity requiring public investment, or a convenience that should be left to the private sector? [[Full PRP report with Dashiell Daniels](#)]
- Find more project reports that are not formally published on the [LBJ DSPA Certificate site](#)

### Parameter 2: Reputable datasets and/or original data collection

- Reputable empirical datasets are typically open source or available to currently enrolled UT Austin students (examples below).

Common sources include:

- Kaggle: <https://www.kaggle.com/datasets>
- Data.gov: <https://catalog.data.gov/dataset>
- American Community Survey (ACS): <https://www.census.gov/programs-surveys/acs/data.html>
- GitHub: <https://github.com/awesomedata/awesome-public-datasets>
- Eurostat: <https://catalog.data.gov/dataset>
- Harvard Dataverse: <https://dataverse.harvard.edu/>
- FiveThirtyEight: <https://data.fivethirtyeight.com/>
- If your project needs original data, discuss original data collection methods with your project advisor.

### **Parameter 3: Demonstration of required DSPA Certificate skills**

- Project report and materials should plainly demonstrate the four skills required for the DSPA Certificate (see section on “DSPA Certificate Requirements” above):
  - Modern Software Platform
  - Statistical/Machine Learning Methods
  - Processing Datasets
  - Data Summary & Visualizations

### **General Guidelines: Individual data science project (DSP) outputs**

- Final Written Report
  - Typically between 20-75 pages, double spaced, 11-12pt font.
  - Include visuals to demonstrate data, appendices may include statistical analytical detail.
  - Citation can be in any academic format (e.g., APA, Chicago) and bibliography/citation pages must be included.
  - Methods
    - Include information on the dataset used, research methodology, and summary statistics.
    - If applicable, include the algorithm(s) employed, relevant quantitative formulation/equations, variables, and other necessary context for models.
  - Content
    - Interpret empirical findings and relevance to a lay audience.
    - Clearly define policy implications and recommended actions (if any).
    - Provide discussion questions and suggestions for future research.
- Additional materials
  - Data analyses, models, or spreadsheets should be provided to the DSPA Certificate Coordinator and your project advisor. Provide clear written context to ensure your materials can be easily understood.

*These guidelines are not exhaustive and you do not need to include every aforementioned element into your final project report. This is meant to provide a starting point and expectation of final deliverables.*

### **Frequently Asked Questions (FAQs)**

Visit the [DSPA Certificate FAQ page](#) for answers to frequently asked questions.