

Program-Level Assessment Plan

Program: Post-baccalaureate certificate in Analytics	Degree Level (e.g., UG or GR certificate, UG major, master’s program, doctoral program): GR certificate program
Department:	College/School: School for Professional Studies
Date (Month/Year): 06-21	Primary Assessment Contact: Srikanth Mudigonda

Note: Each cell in the table below will expand as needed to accommodate your responses.

#	Student Learning Outcomes	Curriculum Mapping	Assessment Methods		Use of Assessment Data
			Student Artifacts (What)	Evaluation Process (How)	
	<p>What do the program faculty expect all students to know or be able to do as a result of completing this program?</p> <p>Note: These should be measurable and manageable in number (typically 4-6 are sufficient).</p>	<p>In which courses will faculty intentionally work to foster some level of student development toward achievement of the outcome? Please clarify the level (e.g., introduced, developed, reinforced, achieved, etc.) at which student development is expected in each course.</p>	<p>Student Artifacts (What)</p> <ol style="list-style-type: none"> Which student artifacts will be used to determine if students have achieved this outcome? In which courses will these artifacts be collected? 	<p>Evaluation Process (How)</p> <ol style="list-style-type: none"> What process will be used to evaluate the student artifacts, and by whom? What tool(s) (e.g., a rubric) will be used in the process? <p>Note: Please include any rubrics as part of the submitted plan documents.</p>	<ol style="list-style-type: none"> How and when will analyzed data be used by faculty to make changes in pedagogy, curriculum design, and/or assessment work? How and when will the program evaluate the impact of assessment-informed changes made in previous years?
	<p>Graduates will be able to implement analytics systems that facilitate context-appropriate decision making.</p>	<p>AA 5000/5100/5200/5300/5750/5800,</p>	<ol style="list-style-type: none"> Final projects, submitted at the end of each course. In each of the courses listed in the second column. 	<ol style="list-style-type: none"> Rubrics associated with the final project will be used for assessing these artifacts. The course instructors for the respective courses will be evaluating these artifacts. Rubrics shared alongside this document as separate PDFs. 	<ol style="list-style-type: none"> Data will be collected and analyzed either annually, or once every two years, depending on whether changes were made to any of the courses as a result of the previous year’s assessment process. Changes to the curriculum will be made during a current year, following the results of analyzing data from the previous year/cycle, and the effect of the changes will be assessed during

					the subsequent year.
	Graduates will be able to utilize argumentation skills appropriate for a given problem or context.	AA5000	<ol style="list-style-type: none"> 1. Final projects, submitted at the end of AA 5000. 2. In AA 5000. 	<ol style="list-style-type: none"> 1. Rubrics associated with the final project will be used for assessing these artifacts. The course instructors for the AA 5000 will be evaluating these artifacts. 2. Rubrics shared alongside this document as separate PDFs. 	<ol style="list-style-type: none"> 1. Data will be collected and analyzed either annually, or once every two years, depending on whether changes were made to any of AA 5000 as a result of the previous year's assessment process. 2. Changes to the curriculum will be made during a current year, following the results of analyzing data from the previous year/cycle, and the effect of the changes will be assessed during the subsequent year.

Additional Questions

1. **On what schedule/cycle will faculty assess each of the program's student learning outcomes? (Note: It is not recommended to try to assess every outcome every year.)**

One-to-two learning outcomes will be assessed each year, based on the current evaluation plan and, if needed, any changes necessitated in re-prioritizing due to changes to the curriculum or any contingency that may have arisen during the previous evaluation cycle year.

2. **Describe how, and the extent to which, program faculty contributed to the development of this plan.**

The program has a single full-time faculty member associated with it. This individual is the director of the program. Assessment of learning outcomes, making revisions to the curriculum, and associated tasks are part of this individual's assigned responsibilities.

IMPORTANT: Please remember to submit any rubrics or other assessment tools along with this plan.

AA 5300 Rubric for data analysis project

Rubric for data analysis project

Criteria	Ratings	Pts
<p>Introduction - overview of data</p> <p>1. Overview of the dataset:</p> <p>a) Contextual information:</p> <p>i. Source of the data. (1)</p> <p>ii. A brief description of objectives behind the collection of the data. (1.5)</p> <p>iii. The entity that collected the data. (0.5)</p> <p>iv. Questions that audience interested in the dataset and its analyses might seek to see answered, etc. (2.5)</p> <p>Present the questions in a numbered list. (0.5)</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>6 pts</p>
<p>Introduction - variables</p> <p>b) Variables present:</p> <p>i. Their types (categorical/continuous). (1)</p> <p>ii. Their roles (predictor or outcome). (1)</p> <p>Present this information in a table with appropriate column headers. (0.5)</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>2 pts</p>
<p>Type of analyses</p> <p>2. Type of analyses:</p> <p>a) A brief explanation of which analytical techniques are applicable for regression and why. (1)</p> <p>b) A brief explanation of which analytical techniques are applicable for classification and why. (1)</p> <p>The descriptions of the methods will be in brief in this section; detailed explanations are to be provided in the Analyses section – see the first requirement in Analyses below.</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>2 pts</p>
<p>Analyses - overview</p> <p>1. Overview:</p> <p>In a table with three columns and one row per method, describe in sufficient detail:</p> <p>a) Methods of analyses that are applicable. (3)</p> <p>b) For each method, an explanation of whether you intend, or not, to use the method (3)</p> <p>c) Present concisely the rationale behind using or not using the method, within the context of your dataset, and what you know about the method's strengths and weaknesses. (3)</p> <p>d) If you have used clustering or dimensionality reduction, explain in what way this/these technique/techniques aided the model building process. If you have not used either of these approaches, explain why these methods were not used (2 points).</p> <p>e) If you have used subsampling to obtain a reduced (rows) version of your dataset in order to achieve model fit in a reasonable amount of time, explain the details of the approach you have used (please feel free to use the approach that was described during the week 7 Zoom session and in the Canvas Q+A discussion thread (response posted on March 6, 12:06 AM) by the instructor to substantiate your choice</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>13 pts</p>

Criteria	Ratings	Pts
<p>of subsampling strategy. If you did not use subsampling, explain why that was not needed. (2 points)</p>		
<p>Analyses - summary of results</p> <p>2. Summary of results: Create a table for each method that you have used (that is, if you have used three modeling techniques, you will include three individual tables, one per each technique), where you present:</p> <p>a) Details of the validation method used (k-fold CV, preferably with repetitions, using Caret or hand-written k-fold CV code) (1)</p> <p>b) Model formulas of the various models you have fit using the particular method. (3)</p> <p>c) An explanation, using appropriate evidence, of model selection and evaluation measures used for identifying the best model, and determining the range of its applicability. (3– see point 2 in Conclusions)</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>7 pts</p>
<p>Conclusions - 1</p> <p>Based on a comparison of the results from the modeling techniques you have employed, and the results of the associated “best” models, explain which modeling technique performed the best. (4)</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>4 pts</p>
<p>Conclusions - 2</p> <p>Provide a description of the results of the best model. Explain them within the context of your dataset, taking into account the assumptions and theory associated with the modeling technique. For example, if you found that a random forest model outperformed all other models built using several modeling approaches, explain why you think that is. Then, explain what the importance statistics/variation in parameter estimates associated with the model imply to a decision-maker. (6)</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>6 pts</p>
<p>Conclusions - 3</p> <p>Based on your understanding of the dataset and your analysis of it, what future work do you think will provide deeper insights into how the dataset can help a decision-maker who is associated with the context within which the dataset was collected? (4)</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>4 pts</p>
<p>Submission requirements</p> <p>1. In addition to the project report, please provide the R source code in an individual .R file. (1)</p> <p>2. Be sure to include your name and the “final data analysis project” the filename. Also, please include your name at the top of the R source file. (1)</p> <p>3. Where needed, include meaningful comments in the R source code so that the reader can understand your intent. (2)</p> <p>4. Be sure that the comments are consistent with the code (if you copy+paste code from previous assignments, you may, inadvertently include comments that are not applicable to your final project – be sure to check for consistency!). (1)</p> <p>5. Along with the source file, please include your dataset in a form that is readily</p>	<p>This area will be used by the assessor to leave comments related to this criterion.</p>	<p>10 pts</p>

Criteria	Ratings	Pts
<p>readable in R. In the R source code files, when you use read.csv(...) or similar function calls for loading the data into the R environment, please embed the name of the datafile directly, that is, pass the name of the file directly into the read.csv(...) function as its first argument. Do not make the user type the name of the file at run time. Please ensure that the data file can be read from the current folder/directory, rather than from a directory that is specific to the folder/directory structure on your computer. (1)</p> <p>6. When submitting your work, please include the following files into a folder, create a compressed archive of it (zip format), and upload the compressed archive (2):</p> <p>a) Your project report in the form of a PDF file, with appropriate filename (indicating your name and "final project" in it). (0.5)</p> <p>b) R source code file (0.75)</p> <p>c) Your datasets in a readily-readable form (0.75)</p>		
Total Points: 54		

Name **AA 5800** Applied data analysis project's rubric

Description

Rubric Detail

	Levels of Achievement
Criteria	Score on the criterion
Introduction 1.a.	<p>0 to 1 points</p> <p>a) the source of the dataset and the purpose for which it was collected</p>
Introduction 1.b	<p>0 to 3 points</p> <p>b) description of the specific variables in the dataset, presented in a table with three columns, which are, successively: name of the variable, its measurement type, and its purpose (predictor and/or outcome)</p>
Introduction 2.	<p>0 to 4 points</p> <p>2. Three research questions, which you intend to answer via analysis of the dataset</p>
Introduction 3.	<p>0 to 4 points</p> <p>3. Specific hypotheses derived from your research questions, stated in a manner that they can be addressed via measures of ROPE and HDI of the appropriate model parameters.</p>
Models 1.	<p>0 to 3 points</p> <p>1. A description of your model, or models, specified in the form of equations containing specific combinations of predictors and their associated parameters.</p>
Models 2.	<p>0 to 4 points</p> <p>2. A diagram, representing the relationship among the outcome, predictors, various model parameters, their priors and the likelihood function. Please use a schema similar to the figures used in our textbook. You are welcome to draw the figure by hand and include an image version of it in your document.</p>
Results 1.	<p>0 to 6 points</p> <p>1. Appropriate graphical and numerical output that is relevant in the context of the hypotheses stated in Introduction.</p>
Results 2.	<p>0 to 6 points</p> <p>2. An interpretation of the output to determine whether there is support for the hypotheses (use ROPE and HDI in your arguments).</p>

Criteria	Levels of Achievement Score on the criterion
Conclusions 1	0 to 6 points 1. Summarize your results and explain what they mean, together, in the context of the initiative that led to the collection of data that you used.
Conclusions 2	0 to 4 points 2. Identify and describe at least two avenues for future work that builds on your findings.
Conclusions 3	0 to 3 points 3. Explain any difficulties you encountered while completing your project and what approach(es) you have used for overcoming them.
Additional requirements	1 to 5 points 1. Please proof-read your report to reduce the occurrence of errors in spelling, grammar, and argumentation. 2. Include a footer, with page number, on each page. 3. Include a title page, with your name, the name of your dataset/project, and the course number + name. 4. Ensure that you include all of the relevant information and that your report is no longer than 10 pages (using 1" margins, 11-point serif font (like Times New Roman), and a reasonably-sized line-spacing. 5. Include appropriate comments to annotate your R source code. 6. Be sure to submit your dataset in a form that can be imported readily into R. either perform all data manipulations ahead of time, and use a "cleaned" version of your dataset in your analysis or include all of the cleaning operations' commands in your R source file

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