

Data Analytics KSAs for Curriculum Alignment

| 5. Probability and Descriptive and Inferential Statistics | | | | | | |
|---|--|-------------------------------|-------------------------|------------------------------------|--------------------|------------------|
| | KSA Description | Knowledge, Skill, or Ability? | Bloom's Taxonomy Level? | Cross-cutting KSAs | Course Number/Name | Learning Outcome |
| a | Demonstrate knowledge of probability and standard statistical distributions. | Knowledge | 1 | Generalist 2a | | |
| b | Explain core statistical inference concepts (for example, deriving relevant hypotheses, evaluating the hypotheses, and prediction with uncertainty). | Knowledge | 2 | Machine Learning 1a | | |
| c | Differentiate among data analytic approaches (e.g., descriptive vs. diagnostic vs. predictive vs. prescriptive analytics). | Knowledge | 2 | Generalist 1e, Machine Learning 1b | | |
| d | Demonstrate and explain the role and importance of model validation and accuracy metrics in analytics projects, hypothesis testing, and information retrieval. | Knowledge | 2 | Generalist 2c | | |
| e | Explain core probability concepts (e.g., random variables, key distributions, conditional probability, Bayes theorem). | Knowledge | 2 | Machine Learning 1c | | |
| f | Explain sampling methods (for example, stratified sampling, simple random sampling, and cluster sampling). | Knowledge | 2 | | | |
| g | Articulate the limits of statistical inference and statistical measurement. | Knowledge | 2 | | | |
| h | Interpret and explain results from analysis based on the data analytics problem statement. | Skill | 3 | | | |
| i | Choose appropriate statistical methods and apply towards data analysis. | Skill | 3 | | | |
| j | Provide rationale for selecting the appropriate sampling methodology. | Skill | 3 | Machine Learning 4g | | |
| k | Demonstrate the ability to develop question sets that lead to actionable analytics. | Ability | 3 | | | |
| l | Draw insights from results of analysis in the context of the original problem. | Ability | 3 | | | |