

## **M.S. in Applied Data Science**

Syracuse University School of Information Studies, in collaboration with the Whitman School of Management

### **Project Portfolio Milestone Requirement Detailed Description and Procedures**

Revised: December 2018

#### **Overview:**

*Students will choose assignments and projects worked on in courses during their studies, which reflect abilities specified in the program learning outcomes, for inclusion in their personal portfolio. A panel of faculty who teach the courses included in the program will review the portfolios of graduates during the students' final term. The panel will approve the portfolio for each student as a transcript milestone required for the degree.*

#### **Rationale for the Portfolio:**

The MS in Applied Data Science is a practitioner's degree - while the curriculum is founded upon firm theoretical underpinnings, the program is designed to be a professional program with a strong emphasis on the applications of data science to enterprise operations and processes, particularly in the areas of data capture, management, analysis and communication for decision-making. Therefore, the evidence of such learning must show how the graduate has been able to synthesize the degree's diverse areas of study into their own cognitive strategy for data-based decision making.

The application of Data Science is potentially as diverse as enterprise operations and processes can be, multiplied by the variety of potential data-based decision making that might affect these operations and processes. To show mastery of this subject, graduates must be able to demonstrate that they have been able to master each fundamental aspect of this discipline, while also being able to synthesize their individual ability to analyze, interpret and clearly recommend actions to stakeholders in organizations when challenged with new operational problems to solve.

Many of the courses taken within the Applied Data Science program involve project-based research and deliverables that demonstrate the student's ability to apply the concepts of data science at an advanced level within a particular domain, and oriented to a specific interest of the individual student. For example, the project deliverables required by such courses might demonstrate the following overall student learning:

1. Data collection: using tools to collect and organize data
2. Data analysis: identify patterns in the data via visualization, statistical analysis, and data mining
3. Strategy and decisions: develop alternative strategies based on the data
4. Implementation: develop a plan of action to implement the business decisions

These project deliverables in and of themselves can demonstrate a significant capability for applied data science on the part of the student who successfully completes one or two of these courses. However, such a single course deliverable does not necessarily demonstrate that the graduate has achieved the advanced cognitive strategies required by the program overall. This can be more effectively achieved if students assemble evidence and reflect on how each course they have taken has contributed to their own acquisition of the cognitive strategies defined in

the program learning outcomes, and how this has enabled them to become professionally prepared in their chosen area of specialty. With such self-reflection, it is more likely that students will be able to employ such strategies when confronted with new challenges in the field. In addition, while a grade given to a project or assignment by an instructor for a particular course may show the degree to which the student has met the expectations of that particular instructor, a panel of key instructors who evaluate an overall set of multiple projects or assignments will perform a similar function as a thesis committee - ensuring more conclusively that the graduate has achieved the overall program learning goals.

Conventional use of the term “portfolio” in education often describes a requirement to archive past assignments from courses as the degree progresses and then to turn over this archive as physical evidence of learning in each course. Such activities are primarily recordkeeping functions - not usually required to be self-contained acts of overall cognitive synthesis. However, in this program, the intent of the portfolio is for the student to retrospectively reflect on how each course became a step toward their ultimate present abilities in light of the program learning goals and within their chosen area of specialty - constructing evidence that they have achieved the necessary preparation in their field. While individual assignment deliverables will be contained in the portfolio’s appendices, **the core of the portfolio is a written analysis of learning in the form of a properly cited paper that links the student’s projects and assignments to key concepts in the field and justifies how the student’s deliverables have demonstrated their individual mastery of these concepts.**

Therefore, this program employs a special form of Project Portfolio preparation and review which requires the student to synthesize their overall learning throughout the program into a comprehensive summary assessment of their own cognitive abilities in the terms of the program’s expected learning outcomes, and involves a panel of instructors to determine that the portfolio sufficiently demonstrates this achievement. By making the portfolio a required milestone for graduation that is distinct from a course, the feedback given to degree candidates as they prepare their portfolios can help them to better reflect and synthesize their overall learning.

The following details the preparation and assessment of the Project Portfolio for the MS in Applied Data Science:

**Demonstrate Achievement of Program Learning Goals:**

The overall goal of the Project Portfolio is to demonstrate to a panel of faculty experts that the student is able to:

1. Describe a broad overview of the major practice areas in data science.
2. Collect and organize data.
3. Identify patterns in data via visualization, statistical analysis, and data mining.
4. Develop alternative strategies based on the data.
5. Develop a plan of action to implement the business decisions derived from the analyses.
6. Demonstrate communication skills regarding data and its analysis for managers, IT professionals, programmers, statisticians, and other relevant professionals in their organization.
7. Synthesize the ethical dimensions of data science practice (e.g., privacy).

**Assessment of the Portfolio:**

Faculty associated with the ADS program will perform the assessment of student portfolios.

If a given student's portfolio does not demonstrate that they have sufficiently met the learning goals of the program, the student will be able to resubmit the portfolio with appropriate changes. In this case, the portfolio would be reviewed again by the same faculty reviewers.

## Submission Details:

Each student must submit all portfolio materials and documents in the course shell, and provide a link to their project code in GitHub, Google or Dropbox, giving permission to view the documents to the current faculty member overseeing the milestone: Jeff Saltz, [jsaltz@syrr.edu](mailto:jsaltz@syrr.edu). Organize your sub-folders/files as follows:

1. Overview document providing student identification (name, SUID number, email, etc.) and table of contents of the folder.
2. The student's current professional resume.
3. Written paper that contains each learning goal of the program linked to the deliverables the student created in courses that demonstrate achievement of that learning goal. Reference will be made as to how the various assignment and project deliverables additionally contributed to the student's preparation for work in their chosen specialty area(s), how they demonstrate their present areas of strength and challenge, and how the student intends to leverage their studies in a program of life-long learning in the field. Works in progress will be appropriately assessed as well. The paper will include references to key conceptual works in the field that shaped their learning throughout the program and how that occurred. There is no length requirement for the paper; it needs to be long enough to link all learning outcomes to the projects students have completed during their program of study.
  - a. **DUE DATE OF DRAFT:** A draft of the written paper for campus students graduating in May 2019 is due **FRIDAY, FEBRUARY 22.**
  - b.
4. A sub-folder for each specific key project/assignment deliverable referenced in the paper. In each folder, a document file must be included that describes the files in the folder and how each may be reviewed (software required, etc.). Sub-folder naming will include course numbers in a specific format. It is expected that at least three projects will be included in the portfolio.
5. Video file of the student presenting a summary of the written paper. This presentation will be 20-30 minutes and should be formatted as a formal presentation to the faculty panel. This video presentation will itself serve as partial evidence of the student's achievement of program learning outcome #6 above (communication skills) and should be produced as such. **The submission of the video file indicates the student has completed the portfolio milestone and it is ready to be graded.**
  - a. **DUE DATE OF FINAL PORTFOLIO:** For campus students graduating in May 2019, the deadline to submit the final portfolio, including the video file, final paper, and all other documents, is due **FRIDAY, APRIL 5.**