



# Part 2

# Department Master Syllabus

**Camden County College**

**Blackwood, New Jersey**

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| **Course Number:**  DSC-280 | | **Course Title:**  Data in Context--A Capstone Experience | | | |
| **Department/Program:** Math/Data Science | | | | | |
| **Date of Review:** March | | 2020 | | | |
| (This Department Master Syllabus has been examined by the program/department faculty members and it is decided that no revision is necessary at this time.) | | | | | |
| **Date of Revision:** New Course, March | | | | 2020 | |
| (This Department Master Syllabus has been examined by the program/department faculty members and it is decided a change requiring a revision is necessary at this time.) | | | | | |
| N.B. A change to the course materials alone (textbooks and/or supplementary materials) may not constitute a revision. Any other change to the items listed below on this form is considered a revision and requires approval by the department/program faculty at a department/program meeting and by the division at a Chairs and Coordinator meeting. | | | | | |
| **Credits:**3 | | | | | |
| **Contact Hours** | **Lecture:** 2 | | **Lab:** 2 | | **Other:** 0 |
| Prerequisites: DSC-203 | | | | | |
| Co-requisites: DSC-230, DSC-250 | | | | | |
| Course Description: This capstone course will provide the student with the opportunity to apply their acquired knowledge and skills in mathematics, statistics, and computer science to the practice of data science to build a portfolio project.  The course will cover the spectrum of the data science workflow from initial investigation and data acquisition to the communication of results. Completing individual and team assigned case studies and projects the students will practice problem formulation, data extraction, wrangling, analysis and visual and written presentations using professional tools and techniques. | | | | | |
| **Student Learning Outcomes (SLOs)**  Course specific student learning outcomes  Upon completion of this course the student will be able to:   * Formulate an interesting question to be answered to which there is an available big data resource to explore as assessed by written reports and projects. * Gather the raw data sets and apply wrangling techniques that clean the messy data to that generates usable predictive outcomes as assessed by projects and labs. * Explore the data by applying statistical analysis techniques to discover patterns and relationships in the cleaned data set as assessed by projects and labs. * Model data using machine learning techniques as assessed by projects * Present the results of a complete project in written and oral formats that include graphical presentation as assessed by projects.   As assessed by:  Students will be evaluated on the degree to which student learning outcomes are achieved. Methods include programming projects and labs. | | | | | |
| **General Education Student Learning Outcomes**  If this course has applied for General Education Elective Status the general education student learning outcomes listed below must exactly match those the sponsor has identified on the General Education Request form.  General Education SLOs:  N/A  As assessed by:  N/A | | | | | |
| **Program Learning Outcomes**  List all course level student learning outcomes that interconnect to a particular program learning outcome.  All CSLOs target portions of each of the DSC.AAS PSLOs   1. Exhibit professionalism and adopt ethical decision-making principles for the analysis, management and presentation of data with an understanding of one’s responsibilities within a professional setting. 2. Develop solid analytical reasoning, critical thinking and technical skills in order to extract, mangle, analyze and present data for multiple disciplines to broad audiences that follow professional standards to enhance understanding and decision-making. 3. Demonstrate the ability to work independently and as a member of a team with modern technical tools to accomplish data life cycle project goals and meet deadlines. 4. Communicate technical knowledge effectively for a broad range of persons that include customers, managers, and peers.   Describe the assessment of the interconnected program learning outcome(s).  Various course level assessment instruments will be used to target specific program learning outcomes. | | | | | |
| **Course Outline:**   1. Overview, Understanding the Problem, and Getting the Data    1. Understanding the problem    2. Getting and cleaning the data    3. Submit proposal to the client 2. Exploratory Data Analysis and Modeling 3. Prediction Model    1. Build and evaluate your prediction model    2. Make your model efficient and accurate 4. Creative Exploration    1. Improve the predictive accuracy while reducing computation runtime and model complexity 5. The First Component of Final Project: Data Product 6. The Second Component of Final Project: Slide Deck 7. Final Project Submission and Evaluation | | | | | |
| **Course Activities:**    The classroom activities will include formal and informal lectures and structured, supervised active learning laboratory sessions. During lectures, new material and assigned problems will be explained. Students are encouraged to contribute to the discussion and to ask questions about the material. Active laboratory learning sessions will include individual and team projects that use individual and collaborative modern software tools to examine, develop and report on data science case studies. | | | | | |
| **Course Materials:**  Textbook(s): TBD  Supplemental Materials: **:**  Software Licenses: Free software tools  Computers: Students will need access to a computer for assigned projects and homework | | | | | |
| **Course Assessment Plan**  How often and by what means will the effectiveness of this course as part of the curriculum be assessed?    Assessment cycle to be determined by the members of the department. Students will be evaluated on the degree to which student learning outcomes are achieved. Assessment instruments may be in the form of tests and/or programming projects. | | | | | |