

**Part 2**

# Department Master Syllabus

**Camden County College**

**Blackwood, New Jersey**

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| **Course Number:**  DSC-203 | | **Course Title:**  Data Science III | | | |
| **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-102, MTH-172 | | | | | |
| Co-requisites: None | | | | | |
| Course Description: This course is the third course in a three-course sequence that examines the core activities that a professional data scientist performs throughout the data science workflow.  Building on the knowledge attained in DSC-102, this course will focus on the data analysis phase activities of quantifying and modeling data. Topics covered include linear, logistics, and polynomial regressions, clustering and pipelines. Students will practice modeling and analysis with real-world datasets using modern software tools. | | | | | |
| **Student Learning Outcomes (SLOs)**  Course specific student learning outcomes  Upon completion of this course the student will be able to:   * Compare and contrast different models and decision-making strategies for best fit as assessed by homework, tests, and projects. * Distinguish usable from unusable data for analysis as assessed by homework, tests, and projects. * Perform descriptive, predictive, and prescriptive analysis as assessed by homework, tests, and projects. * Manage computational complexity in predictive models as assessed by homework, tests, and projects.   As assessed by:  Students will be evaluated on the degree to which student learning outcomes are achieved. A variety of methods may be used such as tests, class participation, programming projects, homework assignments, online learning tools, etc. | | | | | |
| **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 the following DSC.AAS PSLOs    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.  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.  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.  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. Review of Importing Datasets and Data Wrangling    1. Python packages for data science    2. Importing and exporting data    3. Dealing with missing values    4. Data formatting and normalization 2. Exploratory Data Analysis    1. Descriptive statistics    2. GroupBy in Python    3. Correlation – Statistics    4. Analysis of Variance ANOVA 3. Model Development    1. Linear regression    2. Multiple linear regression    3. Logistic regression    4. Model evaluation using visualization    5. Polynomial regression and pipelines    6. Clustering    7. Measures for in-sample evaluation    8. Prediction and decision making 4. Model Evaluation    1. Overfitting, underfitting and model selection    2. Ridge regression    3. Grid search 5. Data Analysis Case Studies | | | | | |
| **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. | | | | | |