DAT-202 – Data Analytics 2
COURSE OUTLINE

Class Section(s) Time & Location: Tuesdays 6-9:10pm in North 1142

Instructor:	Coral Sheldon-Hess	Semester:	Spring 2020
Office Hours:	Mondays 2-5pm N2036 Tuesdays 4-5pm N2036 Thursdays 5-6pm online	Office Location:	North 2036 (map)
Instructor Contact Methods:	**Email** (best way to reach me): csheldon-hess@ccac.edu *Note*: in order to email me code, either paste it into the message text or save the file with a .txt extension before attaching it **Slack**: https://ccac-data-analytics.slack.com/, @coral (post your message in the #dat-202 channel, but feel free to tag me) **Phone** (worst way to reach me): 412-369-4217		
Department Phone:	412-369-4107	Department Chair:	Rebecca Elinich

Course Credits:	3
Pre- / Co-requisites:	DAT-201
Course Description:	Building upon the principles set forth in prior coursework, students will engage in a comprehensive approach to the application of data analytics in the solving of business problems by employing the techniques frequently used in the discipline. Emphasis will be placed on the different types of forecasting techniques such as sales, risk, retention and attrition as applied to a variety of industries.
Learning Outcomes (from master course syllabus):	Upon successful completion of the course, the student will: 1. Differentiate the data needs for the different forecasting techniques. 2. Use appropriate database for specific forecast. 3. Implement data analytics forecasting. 4. Collaborate on using data for forecasting. 5. Use data visualization to illustrate forecasts.

Textbook & Materials	Libre Office or Microsoft Excel Python (Anaconda 3.7 preferred) with data science packages installed (provided on CCAC machines) In general, we'll prioritize resources that are available for no charge on via the internet, all of which will be linked via our session pages linked on the course schedule.

Course Policies & Procedures

Evaluation Plan:	As a lab-like course built around using data analytics tools to solve non-trivial, business-related problems, course assessments in DAT-202 are based on fully-baked student work products. The instructor provides incremental feedback to students during the course of the module's individual project work time--often called formative assessment. Small misunderstandings or trouble spots that emerge inside a module can be ironed out before they impede the larger learning goals of the component. After all modules are mastered and a final project completed, the instructor offers additional, formal feedback concerning the project's alignment to its design specifications is provided. Students complete the following steps in in advance of their presentation and feedback session for their culminating project: • Project design specifications • Project flow diagram adjusted to reflect actual implementation • Thoughtful responses to "heart-of-the-matter" questions ***Using design criteria alignment in place of rubrics*** The best assessment tools are those with which the students directly engage in creating and using. This can take the form of a class-generated project rubric, for example. As students create assessment criteria prior to implementing a project, the resulting work is both more likely to align to the assessment criteria and meaningfully assist students in completing their work. When that rubric is then used by the students to assess their own work, valuable mental processes are underway which tend to naturally improve skill and confidence.

	Rubrics are widespread and useful tools for many types of student work outside of the technical design realm. In a technical class, such as this data course, the process of assessing student code against initial design requirements often organically takes the place of rubric-based assessment without displacing its generic value as a teaching tool. ***Mapping project performance to course letter grades*** The following table serves as a possible correlation guide between module and component project assessment and the formal course letter grades instructors assign to each student at the conclusion of the semester: A - Independent practice for **each model is completed and documented.** Culminating projects for each component meet all specified design criteria. Component reflections show **evidence of synthesis**with other technical learning domains. B - Independent practice for each module has been **attempted but not consistently documented** to reveal command of the code. Culminating projects for each component meets some but not all design criteria. Component reflections show **moderate thought, limited to current learning topics.** C - Independent practice for **1/2 to 2/3 of modules has been attempted** but not consistently documented. Culminating projects for each component **meets some but not all** design criteria. Component reflections show **low levels of thought** relative to A and B work. D - Independent practice for **less than 1/2 of modules** has been attempted but not consistently documented. Culminating projects for each component meets few, if any design criteria. Component **reflections are incomplete.** F - Independent practice for 1/4th or fewer of modules has been attempted and not consistently documented. **Culminating projects were not meaningfully attempted.** Component reflections were not attempted. ***Documenting work done outside of class*** Each student is expected to document the time they spend on their studies outside of classroom time. This documentation should serve as a self-assessment tool, but may potentially contribute to peer- and instructor-assessment, as well. The format of the documentation is left up to the individual student, though a

	spreadsheet with the following categories would be a good starting point: 1. Background reading, including documentation and tutorials 2. Project work (hands on keyboard) 3. Design & pondering, sketching out solutions 4. Collaboration Especially when projects are completed as a group, each individual will be expected to contribute and to be able to document their own contributions.
Technology Use:	Much of the practice of data analytics involves wrangling the various software products we need to do our jobs. As such, students are welcome to use their own machines or CCAC-provided Linux installations to complete their work. Some class time will be spent on tool-wrangling, but students will also be expected to spend time outside of class on software installation and configuration.
Academic Honesty:	All sources should be cited, always.
Other Policies and Procedures:	

All students are expected to read and comply with the policies and regulations set forth in the CCAC Student Handbook, including without limitation the College's policies regarding academic and behavioral conduct, the procedures for requesting an accommodation based upon a disability, pregnancy or pregnancy related condition, or a religious observance, and for reporting unlawful discrimination and harassment.

The Student Handbook is available to view and download from the College's website at the following URL: https://www.ccac.edu/academic-rules-and-regulations/rules-and-regulations.php.

The full text of the College's *Policy Manual, Administrative Regulations Manual*, and the Civil Rights Complaint Procedure can also be viewed and downloaded at: https://www.ccac.edu/president/policies-and-regulations.php; https://www.ccac.edu/diversity/title-IX.php; and https://www.ccac.edu/diversity/notices.php.

Information concerning the process and documentation required to request a disability-related accommodation can be obtained by contacting the campus' Office of Supportive Services for Students with Disabilities (OSSSD) or by visiting the OSSSD information page at https://www.ccac.edu/supportive-services/suppotive.php.

Students are reminded that they can access their course information and CCAC email account, the CCAC Academic Calendar (including add/drop/withdrawal deadlines), the Student Handbook, the College's Incident Report form, and many other College services through the MyCCAC portal at: https://my.ccac.edu.

Class Week/Date	Topics / Learning Activities	Assignments / Homework
Week 1 1/28/2020	Welcome and introductions Syllabus review and making plans for the semester What is forecasting? Qualitative methods	
Week 2 2/4/20	Begin Section 1: Quantitative methods – Time series Simple trend forecasting using Excel (trend lines, moving average)	
Week 3 2/11/20	Maybe some stats review is in order?	Student peer teaching?
Week 4 2/18/20	ARMA, ARIMA, Box-Jenkins, and X11, conceptually and implementation in Excel	Student peer teaching?
Week 5 2/25/20	More time series	Student peer teaching?
Week 6 3/3/20	NumPy, Pandas Time series analysis in Python	
Week 7 3/10/20 (midterm grades due)	Begin Section 2: Quantitative methods – Causal Regression analysis	
Week 8 3/17/20	Regression analysis, continued	
Week 9 3/24/20	Econometric modeling	
Week 10 3/31/20	Leading indicator	Get started on final project planning
Spring Break 4/7/20	I don't assign extra work over spring break, but it's a good time to get caught up if you're running a bit behind on your semester, including the final project for this class.	
Week 11 4/14/20	Some machine learning fundamentals	Final project work
Week 12 4/21/20	Trying out some machine learning tools	Final project work
Week 13 4/28/20	Project work time	Final project!

Week 14 5/5/20 6-8pm	Final Project Sharing!	

Course Outline Corrections:
During the semester/session, reasonable changes to the course outline may be academically appropriate. Students will be notified of these adjustments by the instructor in a timely manner.