

## **CSC 465 – CAPSTONE PROJECT IN DATA ANALYTICS**

**CREDIT HOURS:** 3

**PREREQUISITES:** CSC 342, CSC 462 and department chair approval.

**GRADE REMINDER:** Must have a grade of C or better in each prerequisite course.

### **CATALOG DESCRIPTION**

Capstone project in data analytics; application of data analytics techniques, methodologies and technologies in data analytics; teamwork, written and oral communication.

### **PURPOSE OF COURSE**

The purpose of this course is to provide students to opportunity to synthesize and apply knowledge of data analytics to computational problems while considering multiple real-world constraints.

### **EDUCATIONAL OBJECTIVES**

Upon successful completion of the course, students should be able to:

1. Demonstrate the ability to design and implement solutions to open-ended problems while considering real-world constraints.
2. Demonstrate understanding of the data analysis process.
3. Demonstrate competence with issues of teamwork, project scheduling, and time management.
4. Identify data mining techniques and its use in decision-making.

### **COURSE CALENDAR**

This course meets for a minimum of 37.5 lecture contact hours during the semester, including the final exam. Students have significant weekly reading assignments. Students are required to complete a major project and make at least one class presentation, weekly homework/programming assignments, and 2-3 periodic exams in addition to the final exam. Students are expected to prepare for any class assignments or quizzes over the material covered in class or in the reading material. Successful completion of these activities requires at a minimum six additional hours of outside of classroom work each week.

<b>CONTENT</b>	<b>Hours</b>
Formal problem description.....	3
Research problem area.....	6
Formalize attainable goals .....	3
Data preparation process.....	6
Cleanse/Sanitize data	
Select feature set	
Research into best fit algorithm for the data set .....	12

Apply data mining algorithm to the data set.....	6
Apply best fit algorithm	
Generate results	
Apply visualization techniques to results for presentation	
Conclusion and Final project preparation .....	6
Final project presentation .....	3
	TOTAL      45

## REFERENCES

Lantz, B. (2013). *Machine Learning with R*. Packt Publishing.

Steven Bird, Ewan Klein, and Edward Loper. 2009. *Natural Language Processing with Python (1st ed.)*. O'Reilly Media, Inc.

*SQL The Complete Reference*, 3rd Edition / Edition 3 by James R Groff, Paul N. Weinberg, Andy Oppel

James et al. (2013) *An Introduction to Statistical Learning: With applications in R* . Springer.

**EXAMINATIONS:**      (40% of the course grade) – short answer, problems, programs

2 Written Exams	10% each
Final Examination – Comprehensive	20%

**NOTE:**      There are no exemptions from the final examination and no changes in taking the final examination. Check the final exam time. If the final exam time is a problem, you need to drop this course.

**PROJECT:**      (60% of the course grade)

**ATTENDANCE:**      Attendance and **constructive** class participation – expected

## PROGRAM LEARNING OUTCOMES:

Program learning outcomes define the knowledge, skills, and abilities students are expected to demonstrate upon completion of an academic program. These learning outcomes are regularly assessed to determine student learning and to evaluate overall program effectiveness.

- *Students majoring in the Department of Computer Science may access program learning outcomes at <http://cs.sfasu.edu/cs/plo/>*

## CLASS INFORMATION AND POLICIES

Department of Computer Science, McKibben 304, 468-2508

**Attendance:** Seating assignments will be made and roll will be taken regularly. Attendance may be taken into consideration for your final grade. If you come to class, you are expected to be present and awake the entire class period unless you have been given permission to leave early. If you are absent from class, please make sure to get notes from a classmate. There will be no smoking, no chewing of tobacco, no eating or drinking, no bare feet, and no cell phone use during class. Cell phones and other electronic communication devices must be turned off during class. Possession of a cell phone or other electronic communication device during an exam will result in an examination grade of zero. **Please keep your feet off of the seat backs and seats.** No disruptive behavior including offensive language will be tolerated in a computer science facility or related activity. Such

behavior may result in administrative removal from class. Only students officially registered for the course and approved assistants may attend class. Please do not walk across the front of the room after the class has started. Students entering the classroom after the lecture has started should take a seat in the back of the room.

**Examination Policy:** All class examinations are considered to be a major part of the course work upon which a large part of the course grade depends. There are NO make-up exams! Class examinations will be announced at least two classes prior to the examination. If you have a conflict with another university event, you must contact me well in advance of the examination. In case of an extreme emergency, contact me before the scheduled examination. Failure to do so may result in an examination grade of zero. There are no exemptions for the final examination and no changes in taking the final examination. All students must take the final exam. A zero on the final exam will result in an F in the course. Check the final examination time. If the final examination time is a problem, you need to drop this course. Once the first person has left the room on the day of an examination, no one else will be permitted to begin the exam.

**Assignment Policy:** All assignments are due at the announced time on the specified due date. Assignments will not be accepted late. If you have a conflict, please contact me in advance. You should turn in your homework assignments done neatly, clearly, and to the best of your ability. Follow all the instructions given. You will lose points for failure to follow instructions. Any work turned in to my box should be dated and timed by the CSC department staff. Please ask nicely. **DO NOT** slide any work under my office door or under the door to the Computer Science offices. **PLEASE NOTE: You may be given assignments during the last five class days of the semester.**

**IMPORTANT:** Every programming assignment **MUST** be turned in. Failure to turn in a programming assignment may result in the reduction of one (1) letter grade from the final course grade.

**Software Policy:** Disciplinary action will be taken against individuals who perform unauthorized duplication of software or who are involved in the unauthorized use of duplicated software. Such action may make it impossible for you to successfully complete this course.

**Computer Laboratory Usage:** Students utilizing equipment in university computing laboratories are expected to read and abide by all posted policies for the laboratories. Please note that no children and no pets are permitted in university computing laboratories.

**Drop Policy (Univ.):** The official university add/drop policy is located at: [http://www.sfasu.edu/policies/add\\_drop.asp](http://www.sfasu.edu/policies/add_drop.asp). If you have questions concerning registration, add/drop or the withdraw process, contact the Registrar at (936) 468-2501 or E-mail: [REGISTRAR@SFASU.EDU](mailto:REGISTRAR@SFASU.EDU) The Registrar is located on the 2nd floor of the Rusk building.

**Special Accommodation Requests:** To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [Hhttp://www.sfasu.edu/disabilityservices/H](http://www.sfasu.edu/disabilityservices/H).

Students with special accommodation requests have the responsibility to immediately initiate a meeting with the instructor to discuss how the special accommodations will be provided. Students who are aware of these special needs at the beginning of the semester must inform the instructor in person before the twelfth class day about any class activity, which will require special accommodations.

**Computer Account Policy:** All assignments that require the use of the University Computer must be done under the computer account that is assigned to you in this class. You should NOT do other class assignments in this account, and you should NOT do assignments from this class in other accounts. Failure to abide by the above statements will mean that you will received a grade of F in this course.

**Academic Integrity:** Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1)

submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit. All instances of academic dishonesty will be reported to Office of the Dean of the student's major. This report shall be made part of the student's record and shall remain on file with the Dean's office for at least four years. Instances of academic dishonesty may also be reported to the University Committee on Academic Integrity. A student who wishes to appeal decisions related to academic integrity follows procedures outlined in University policy A-9.1. Please read the complete policy at [Hhttp://www.sfasu.edu/policies/academic\\_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp)H.

If in my judgment an instance of academic dishonesty on an examination has occurred, a grade of zero will be assigned as the examination grade **and** a minimum of one (1) letter grade will be lost in the course grade. **Possession of a cell phone or other electronic communication device during an exam will result in an examination grade of zero.** A course grade of F may be assigned depending on the situation. A student found cheating on an examination may not drop the course. If in my judgment a student is found cheating **on any part** of a homework assignment or quiz, the student will receive **negative** points equal to the value of the **entire** homework/quiz. A negative grade will not be replaced by any possible bonus assignment. **I consider the person who did the work (homework, quiz, test) and the person copying the work as both cheating.** A recurrence of this by any individual will result in a grade of F in the course. **DO YOUR OWN WORK!!!!** Do **NOT** show your code to other students!!!

#### **Withheld Grades Semester Grades Policy (A-54)**

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

#### **Acceptable Student Behavior**

Classroom behavior should not interfere with the instructor's ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic, or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

**Identification:** Valid student I.D. cards must be presented on each examination day. (No I.D...No exam...Grade of zero)