Capstone Project in Data Analysis
CSCI 4365.001

Instructor Info —
Dipak K Singh
Office Hrs: MW (2.00-3.00 pm), TR (11-12 pm), F (10-11 am), by appointments
Zoom id: 946 8065 1425
Passcode: 329849
STEM 312K
https://faculty.sfasu.edu/singhd1
singhd1@sfasu.edu

Course Info —
Prereq: CSCI 3342; CSCI 4362 and dept chair approval
Thurs
3.30 - 5.30 pm
STEM 420

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

Material
Required Texts
No textbook required.

Grading Scheme
All course material will be graded based on a rating between 0 to 5, where 5 means your work satisfies all the expectations. Extra credit may be given for exceptional work. All graded items (including writing assignments, presentations, data projects, meeting reports) will be evaluated using rubrics, found in the syllabus Appendix. Late assignments, unless prior instructor approval is obtained, will be penalized at a rate of 0.1 points/day.

<table>
<thead>
<tr>
<th>Grading Scale</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 90</td>
<td>A</td>
</tr>
<tr>
<td>&gt;=80</td>
<td>B</td>
</tr>
<tr>
<td>&gt;= 70</td>
<td>C</td>
</tr>
<tr>
<td>&gt;= 60</td>
<td>D</td>
</tr>
<tr>
<td>&lt;60</td>
<td>F</td>
</tr>
</tbody>
</table>

5% Questions & Objectives
5% Database Management
10% Exploratory Analysis
50% Modeling
5% Final Report
5% Presentation
10% Weekly Progress Evaluation
10% Peer Evaluation

Curving is at the discretion of the professor.

Team
Teams will constitute of 1 or more students. Each team will receive their primary project-specific objective and goals from either an active research area from either an instructor, industry, or the department. It is important that a student is placed onto a project that will utilize their unique data analytics skills and be relevant to their track. Similarly, it is important that students bring and deploy data analytics skills and field-specific knowledge to the team for achieving the project objectives.
## Tentative Class Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Scheduling Class time</td>
</tr>
<tr>
<td>2</td>
<td>Questions and Objectives, Project Allocation</td>
</tr>
<tr>
<td>4</td>
<td>Finishing up with Data Exploration</td>
</tr>
<tr>
<td>5-15</td>
<td>Feature Engineering</td>
</tr>
<tr>
<td></td>
<td>Data Modeling</td>
</tr>
<tr>
<td>16</td>
<td>Final report</td>
</tr>
<tr>
<td>17</td>
<td>Final Project Presentation May 9 (3:30 - 5:30 pm) @ STEM 420</td>
</tr>
</tbody>
</table>

All dates are tentative except final exam

## Evaluation of Student Work

A student will be evaluated based on both their project implementation progress and outcomes, and their abilities to:

1. Identify the questions to be answered and/or data products to be developed.
2. Develop and implement a data management system for the project.
3. Clearly articulate appropriate analytical methods for the projects questions and products.
4. Implement the appropriate analysis and interpret the results
5. Communicate in an organized and professional manner to audiences with different backgrounds

## Workload

This is a 3-credit course. The 3-credit designation normally implies that on average the student is expected to spend 1 hrs (lecture) and 8 hrs (project work) per week working on the course. For this project, we will meet every Thursday for 2 hrs, which will be used for a few lectures (1 hr) in the beginning followed by project discussion (1 hr) or paper presentation. The remaining 7 hrs per week should be invested on additional team meetings, completing writing/presentation assignments, reading the literature related to the project, working on analytical process and modeling, and achieving project goals/outcomes.

## Final Presentation

Each project team shall prepare a digital presentation for the team project and present it during the scheduled time for the course final exam. You may have to present in front of multiple audiences. Project presentation will mainly be evaluated based on quality, content, and design, and final question and answer period. The instructor will evaluate and grade the presentation.

## Weekly Meetings

Each team will meet once a week, typically with the instructor, all team will report their progress for the past week, and prepare a written plan for upcoming week. Each team will prepare 1 or 2 slides summarizing their progress and plan. The presentation file will be loaded to an available dropbox in D2L. A summary of the weekly meeting progress report will be presented to the entire class during class timings.

## Course Management Platform

The project teams will primary use Github for software version control, task management, bug tracking, and posting the meeting notes. The instructor will mentor a team’s progress through it’s repository and will consider the Github activity for evaluating a team’s progress during the semester.
Peer Grading
At the end of the semester, each student will fill-in and submit a peer-evaluation form. Students will be asked to provide feedback about their teammates contributions to the project. The instructor reserves the right to adjust the peer evaluation scores if the instructor agree that the scores were prejudiced (either too high or too low).

Protecting Intellectual Property and Confidential Data
Teams have the obligation to protect both Intellectual Property and data. Do not post your data at non-password-protected websites. All data should be accessed via VPN (when off-campus) and should not be shared with anyone outside your team. Students are encouraged to use the on-campus computers and servers for any project-specific experiments (via remote or direct login access). Ask the instructor if you have any doubts related to data security. Also report to the instructor asap if you suspect any data compromise.

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

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://www.sfasu.edu/academics/colleges/sciences-math/computer-science/about/accreditations

Student Learning Outcomes
In general, SLOs in a course are specific and include the exact knowledge, skill or behavior taught in the course in support of the more global PLOs. For additional information on meaningful and measurable learning outcomes, see the assessment resource page

Course Requirements
Students are expected to attend classes and ensure they have understood the material being taught. Students are encouraged to ask questions and get their difficulties resolved while in class. There will be weekly assignments/objectives given to the student, which a student need to work on to finish the project. The grade percentage to these components are specified in the Grading Scheme above.

Exam Note
There is no written exam in the course. Please follow the grading scheme for details.

Course Calendar
This course meets for a minimum of 37.5 lecture contact hours during the semester, including 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 seven additional hours of outside of classroom work each week.
Meets 3 hrs/wk for 16 weeks. This is a project-oriented class with weekly assignments. The lecture has 2 hours of contact time each week, 1 hr (lecture) and 1 hr (project progress evaluation and discussion) and the work outside of class each week will average 7 hours a week in development, analysis, and validation of codes, understanding the theory undergirding computer networks, reading the required text, and preparing and completing course assessments.

Per SFA policy 5.4, this schedule and chosen exercises reflects that for each credit hour we will have one hour of faculty instruction with at least two hours of out-of-class student work per week. In other words, for an X credit hour class the student should expect X class hours of faculty instruction with 2 time X out-of-class hours of student work per week.

**Asynchronous Minutes**

The students are required to devote 150 minutes outside the instructional hours, where you will be asked to conduct independent study based on online resources (not covered in class) related to the course, and the material will be asked in the HW assignments(s), labs or exams.

**Attendance Policy**

Attendance and constructive class participation is expected. There is no specific grade for attendance. Students traveling for University business/events and those out sick will be excused after they turn in a medical note of absence or University related activity letter from the appropriate authorities.

**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 Content**

The following topics is listed below:

- Formal problem description (3)
- Research problem area (6)
- Formalize attainable goals (3)
- Data preparation process (6)
- Research into best fit algorithm for the data set (12)
- Apply data mining algorithm to the data set (6)
- Conclusion and Final project preparation (6)
- Final project presentation (3)

A more detailed listing of the topics is available at [https://www.sfasu.edu/docs/computer-science/undergraduate-course-CSCI4365.pdf](https://www.sfasu.edu/docs/computer-science/undergraduate-course-CSCI4365.pdf)

**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.

**Attendance**

Seating assignments may 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. 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 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 may not be accepted late (see Assignment Late policy). If you have a conflict, please contact me in advance. You should turn in your homework and lab 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. DO NOT slide any work under my office door or under the door to the Computer Science offices, or in my office mailbox. Follow the instructions on the assignments on how to turn in your assignments. PLEASE NOTE: You may be given assignments during the last five class days of the semester. You may be asked to do your assignments in groups.

If any HW or lab assignments are not posted, then the previous graded HW or lab assignments will be considered and the grades will be distributed evenly.

**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:
https://www.sfasu.edu/docs/hops/04-103.pdf

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. The Registrar is located on the 2nd floor of the Rusk building.

**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, https://www.sfasu.edu/docs/hops/04-106.pdf). 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.

**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.
**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 http://www.sfasu.edu/disabilityservices/

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.

**Mental Health**

SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc. If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

**On-campus Resources:**
The Dean of Students Office (Rusk Building, 3rd floor lobby)
www.sfasu.edu/deanofstudents
936.468.7249
dos@sfasu.edu

SFASU Human Services Counseling Clinic
www.sfasu.edu/humanservices/139.asp
Human Services Room 202
936-468-1041

The Health and Wellness Hub “The Hub”
Location: corner of E. College and Raguet St.

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:

- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

www.sfasu.edu/thehub
936.468.4008
thehub@sfasu.edu

**Crisis Resources:**
Burke 24-hour crisis line 1(800) 392-8343
Suicide Prevention Lifeline 1(800) 273-TALK (8255)
Crisis Text Line: Text HELLO to 741-741

**Academic Integrity**

The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff and students to adhere to and uphold this policy.
Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

Academic dishonesty using AI

Academic integrity is a core value of this course, and any form of academic dishonesty, including using artificial intelligence (AI) to cheat, will not be tolerated. Cheating with AI includes, but is not limited to, using AI-generated content for assignments or exams, using AI chatbots to communicate with others during exams, or using AI tools to generate responses to exam questions. Any student caught engaging in academic dishonesty using AI will face serious consequences, including but not limited to, failing the course and being reported to the appropriate academic authorities. It is important to remember that AI is a tool to assist in learning and not to replace it, and that academic dishonesty undermines the learning experience for everyone. Please feel free to reach out to me well in advance of the due date of assignments for which you may be using AI tools and I will be happy to discuss what is acceptable.