SAINT MARY'S COLLEGE OF CALIFORNIA
SCHOOL OF ECONOMICS AND BUSINESS ADMINISTRATION

OPS-807 Optimization & Supply Chain Analytics
Saturdays: 8:00-12:00 pm, Plug & Play Center

Disclaimer: This syllabus is tentative and may be subject to change.

Instructor: Jahan Ghofraniha
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Office: P&P/virtual office
Office Hours: By appointment

COURSE DESCRIPTION

Supply chain decisions depend heavily on data analysis and quantitative modeling that are based on Management Science tools and techniques. This course is designed to introduce students to the various ways of building optimization models in order to enhance decision-making skills. Our main goal is to enable students to become intelligent users of those techniques broadly categorized as optimization and simulation, and to gain lots of practical experience through hands-on exercises, and case discussion. Each week, students will be introduced to a new technique. Emphasis will be placed on how, what, and why these techniques are useful in the application domain.

COURSE LEARNING OUTCOMES

- Demonstrate knowledge of concepts of management science and supply chain management.
- Develop the appropriate modeling and analytical skills.
- Demonstrate problem-solving and critical-thinking capabilities.

TEXT BOOK

Quantitative Analysis for Management 12th edition by Render et. al, ISBN-13:978-0-13-350733-1. You may choose any format (hardcover, paperback, e-book, or rent). There is a new edition of the book but the changes in the new edition are not major so 12th edition will be used.

SOFTWARE

Python 3.X. It is highly recommended that you install Anaconda environment on your computers before the start of the class. The installation instructions can be found on the SMCMBA under OPS807 general course information heading.

METHOD OF EVALUATION

The course grade breakdown is as follows:

Attendance/Participation:	**10%**
Homework Assignments:	**25%**
Group Project + Presentation:	**40%**
Mid-Term Exam:	**25%**
Total:	**100%**

Total Percentage	**≥92%**	**≥89%**	**≥85%**	**≥80%**	**≥77%**	**≥74%**	**≥70%**	**<70%**
Letter Grade	**A**	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**F**

CLASS ATTENDANCE

- Regular attendance is an important obligation and essential condition for successful academic progress. Absences may seriously jeopardize the successful completion of a course.
- Students are responsible for all assignments in a course whether or not the assignments were announced during an absence. Penalties for absences depend upon the nature and amount of work missed, of which the faculty member is the sole judge.
- Students are required to attend all class sessions. However, an absence of up to 2 four hour class sessions per quarter may be excused with the prior knowledge and agreement of the instructor.
- For any student who has an exceptional circumstance, they must consult with the Academic Program Director and/or the Associate Dean for an alternative to making up the class sessions missed.

PARTICIPATION AND PREPARATION

- Criteria for participation include quality and quantity of contributions, e.g. questions relevant to topics being presented / quantitative problems being worked on / homework assignments, questions that dig deeper into the concepts, and bringing up related real-life articles and experiences.
- The course outline gives you the topic and the associated reading material that will be discussed in each class. You are expected to read the material before coming to class and to actively participate in class discussions.
- In general, showing interest in the material by on-time attendance, participation in discussions, asking good questions, and turning in assignments on time are a good baseline for class participation.

HOMEWORK ASSIGNMENTS

There will be four group homework assignments that will mainly consist of modeling problems and serve as a learning tool for some of the important concepts covered in class. Students will work in groups of four. Due dates are specified in the course outline at the end of the syllabus. There is no late homework policy. No homework will be accepted after the deadline.

GROUP PROJECT

The class project proposal is due by week 6; a separate document will be available for detailed information about the project's guidelines. Students will work in teams of 4 students. We will discuss in class the process by which teams will be composed and topics will be assigned.

EXAMS & PROJECT EVALUATION

There is one exam, that is open notes, open book and open computer. There is no final exam, however, there is a final project that will be evaluated based a formal report following the APA-format and a group presentation with Q&A from all team members. More detailed information on the exam and the final project will be presented during class sessions. There are no make up exams.

POLICY ON ACADEMIC INTEGRITY

You may use any source you find useful in doing assignments or projects, but you must cite your sources in writing. Plagiarism is the copying or paraphrasing of any work from another source without proper written acknowledgement. All members of a group project are expected to assure that all sources are cited.

All students are expected to adhere to Saint Mary's Academic Honor Code set out in the SMC Graduate and Professional Student Handbook. The code, available online, sets out the requirements of academic honesty and the means by which alleged violations are administered. Please familiarize yourself with its provisions.

STUDENT DISABILITY SERVICES

Student Disability Services extends reasonable and appropriate accommodations that take into account the context of the course and its essential elements for individuals with qualifying disabilities. Students with disabilities are encouraged to contact the Student Disability Services Office at (925) 631-4358 to set up a confidential appointment to discuss accommodation, policies, guidelines and available services. Additional information regarding the services available may be found at http://www.stmarysca.edu/academics/academic-advising-and-achievement/student-disability-services.html

ABOUT THE INSTRUCTOR

Jahan Ghofraniha got his undergraduate degree from Sharif University of Technology and his master's and Ph.D. from the University of British Columbia in Vancouver, Canada with specialization in pattern recognition, artificial intelligence, statistical and machine learning. He has over 20 years of industrial experience working in numerous application areas such communication systems, statistical signal processing, digital health and application of AI and deep learning strategies in disease prevention and predication. He was the CTO of health monitoring startup architecting and overseeing the implementation of advanced AI technologies to remote health monitoring systems. He has also been involved in undergraduate and graduate level teaching at universities in Canada and the US for over 20 years. He has been an effective academic administrator as a dean of school of engineering at one of the private universities in the Silicon Valley where he revised the curriculum to be aligned with industry needs. He has been teaching advanced courses in application of machine learning and deep learning in engineering, computer science and business such as marketing and supply chain management.

COURSE OUTLINE (Subject to change)

Week	Topic	Reading	Assignment Due
Week 1 (7/13)	Python Review	Handouts	
Week 2 (7/20)	Mathematical Foundations of Optimization	Module 6	
Week 3 (7/27)	Linear Programming & applications	Chapter 7	HW1
Week 4 (8/3)	Integer Programming & applications	Chapter 10	
Week 5 (8/10)	**Mid-Term Exam (Weeks 1 to 4)**		**HW2**
Week 6 (8/17)	Nonlinear Optimization Models	Chapter 10	Project proposal due
Week 7 (8/24)	Transportation & Network models	Chapter 9	
Week 8 (8/31)	Monte Carlo Simulation Modeling	Chapter 13	HW3
Week 9 (9/7)	Project midpoint evaluation & feedback		
Week 10 (9/14)	Queuing Models	Chapter 12	HW4
Week 11 (9/21)	**Final project presentation and evaluation**		