MSE410/L – Production Systems Modeling and Lab (2/1 units)

CSUN - Spring 2025; Ticket # 16566/16567; Room # JD-1126; Monday: 5:00pm-9:45pm

Instructor ***Ghassan "Gus" H. Elias --*** BS/MS; Industrial/Manufacturing Systems Engineering
- **Expertise:** Engineering Consulting, Decision-Making/Risk Analysis and Facility Planning. Quality Assurance & Control, Industrial Safety & Material Control - global certification programs for installing & commissioning electronic & pneumatic devices in General (Non-Hazardous) Locations, Hazardous 'Classified' Areas & Potentially Explosive Atmospheres.

- Email address: **Gus.Elias@csun.edu**
- Website: **http://www.csun.edu/~ghe59995/**
- MSEM Department Office: JD-4510; (818) 677-2167
- Faculty Office: JD-3308
- Office hours: Monday; 4:00 pm – 5:00 pm ….. **Appointments are set by e-mail.**

Textbooks **1- "Simulation with Arena - 6th Edition" - REQUIRED**
By: W. David Kelton, Randall Sadowski & Nancy Zupick; ISBN-13: 978-0073401317

2- Free software download for students: ARENA Simulation & Modeling; via:
https://www.rockwellautomation.com/en-us/products/software/arena-simulation/buying-options/download.html
REQUIRED

3- RECOMMENDED: "Simulation Modeling & Analysis with ARENA"
By: Tayfur Altiok, Randall Benjamin Melamed; ISBN-13: 978-0-12-370523-5

4- RECOMMENDED: "Simulation Modeling & Analysis"
By: Averill M. Law; ISBN: 978-0-07-340132-4

Additional References - Online research and reading journals on production models & manufacturing systems.

Catalog Description - Concepts and principles of lean manufacturing systems. Methods and tools for application to manufacturing systems improvement. Practices and projects for effective design and implementation of lean manufacturing operation, production, control and quality systems. Prerequisite: MSE 407 or instructor consent.

Course Objectives This course is designed to contribute primarily to the students':

- Knowledge of, and ability to apply, mathematical probabilistic and statistical methods.
- Knowledge of some important issues in the design and operation of manufacturing systems.
- Knowledge of important measures of system performance.
- Knowledge of about behavior of manufacturing systems.
- Ability to use some practical tools for systems design.
- Ability to function on a team from different backgrounds.
- Awareness & understanding of the professional & ethical responsibilities of practicing engineers.
- Ability to communicate effectively, both orally and in writing.

STANDARD OPERATING PROCEDURES:

1. Class members are expected to maintain personal and professional standards consistent with the Code of Ethics of the national Society of Professional Engineers, the Preamble and Fundamental Canons of which are as follows:

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct. Engineers, in the fulfillment of their professional duties, shall:

- ***Hold paramount the safety, health and welfare of the public.***
- ***Perform services only in areas of their competence.***
- ***Issue public statements only in an objective and truthful manner.***
- ***Act for each employer or client as faithful agents or trustees.***
- ***Avoid deceptive acts.***
- ***Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.***

2. Students must submit **ORIGINAL WORK** only.
3. Students are expected to participate in class and on **CANVAS**.
4. Students are **responsible** for the course material, reading assignments, presentations and discussions.
5. ***Tardy/Late submissions are unacceptable*** ….. **NO EXCEPTIONS!**
6. Class members **MUST** always be **considerate & respectful** to their colleagues and to the instructor.

***** This course syllabus is your contract with the CECS, MSEM and the instructor. Students must read the syllabus thoroughly and adhere fully to ALL of the stated terms and listed guidelines. No Exceptions! *****

NOTE #1: Activate **and** use your CSUN email address for ALL academic correspondences. Do not use your personal email address to communicate with the instructor. Messages from non-CSUN email addresses will **NOT** be acknowledged. Instructor will only utilize SOLAR's email database to communicate with class.

NOTE #2: **The last day to drop classes is 07-Feb-2025. Students must initiate this process; not faculty. Failure to formally drop a course will result in a "WU" grade which is equivalent to an "F" grade; affecting your cumulative GPA detrimentally.**

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The use of mobile phones is not allowed during the class/lab sessions, throughout the semester.

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Proposed Schedule/Plan

This is a ***TENTATIVE*** syllabus. Depending on the progress of the course material, the syllabus (dates, topics, assignments & exams) ***may change*** if deemed necessary.

Date	Topics	Reading Assignments / Lab Projects
Wk. 1	Course Introduction: Basics & Outline Ch. 1: Basic Simulation Modeling	Safety and lab procedures What is simulation?
Wk. 2	Ch. 2: Fundamental Simulation Concepts	More on simulation techniques & benefits
Wk. 3	Ch. 3: Simulation Software / **Arena**	A guided tour through **Arena** Term Project: Groups Formation
Wk. 4	Ch. 4: Modeling Basic Operations and Inputs	Term Project: Assignment of Topics
Wk. 5	Ch. 5: Modeling Detailed Operations	Building valid & credible simulation models
Wk. 6	Ch. 6: Statistical Analysis of Output Data	Terminating simulation models
Wk. 7	Midterm Preparation and Material Review.	Continue with unfinished lab work.
Wk. 8	**Midterm Exam (30%) // All material covered in weeks 1-7 // OPEN BOOK & NOTES** **Format: T/F, M.C., Essays & Problem-Solving** **Monday, March 10th, 5:00-7:30 p.m.**	**No lab session after the midterm exam**
Wk. 9	☺ **NO INSTRUCTION / March 17-23, 2025** ☺	**SPRING BREAK – Be Safe / Have Fun**
Wk. 10	Midterm Exam: Outcome & Review Ch. 7: Intermediate Modeling	Continue with unfinished lab work Steady state statistical analysis
Wk. 11	☺ **NO INSTRUCTION / March 31st, 2025** ☺	**Campus closed: Cesar Chavez Day**
Wk. 12	Ch. 8: Entity Transfer	Types of entity transfer
Wk. 13	Ch. 9: Further Modeling Issues & Techniques	Conveyors, transporter and resources
Wk. 14	Ch. 10: Arena Integration & Customization	Software utilization and management
Wk. 15	Ch. 13: Conducting Simulation Studies	Problem formulation & solution methods
Wk. 16	**Course Review & Wrap-Up**	**Term Project --- Group Presentations**
Wk. 17	**FINAL EXAM (35%) // COMPREHENSIVE** (emphasis on material after the midterm exam) **Monday, 12-May-2025, 5:30 - 7:30 pm // Format: T/F, M.C., Essays, Problem Solving** **OPEN BOOK & NOTES**	**Enjoy the summer break** ☺ ☺ ☺ ☺ ☺

GENERAL COURSE STRUCTURE

There are three learning activity tracks that run concurrently throughout this course:

-The first track entails lecture presentations and discussions of topics pertaining to simulation modeling and analysis, production systems, and engineering management.

-The second track involves reading assignments, midterm and final exams (multiple-choice, true & false, write-up essays and problem-solving).

-The third track is the team development of a simulation modeling project. By the 3rd-4th week of the semester, the instructor will establish teams consisting of 4-6 members each, chosen randomly.

Note: Only the term project will be a team effort. All other course tasks and requirements (exams, assignments, etc.) are done solely on an individual basis. The manner in which this course is structured is such that active participation of all class members throughout the semester is essential.

COURSE EVALUATION / GRADE SCALE

(Refer to the last page of the syllabus for more information on grades)

(15 pts) Lab projects and homework assignments.

(30 pts) Midterm Exam (10-Mar-2025). ALL material covered in Weeks 1-7.

(20 pts) Group Term Project: Files must be uploaded on 27-Apr-2025 via CANVAS.

PPT file and **in-class** presentation (**28-Apr-2025**): 18 points
Self & Peer Evaluation Form (SPEF) - Mandatory: 2 points
You can download the SPEF via the MSE410 webpage and CANVAS.

Important Note: By not submitting the SPEF, the student will forfeit the +/- sign for the course grade.

(35 pts) Final Exam / Comprehensive /// 5:30 pm – 7:30 pm , 12-May-2025.
Format: True/False, Multiple Choice, Essays & Problem-Solving.

Letter-Grade Scale (Curving of grades will NOT be utilized!):

A ≥ 92	**88 ≤ A- < 92**	**85 ≤ B+ < 88**
80 ≤ B < 85	**78 ≤ B- < 80**	**75 ≤ C+ < 78**
70 ≤ C < 75	**68 ≤ C- < 70**	**60 ≤ D < 68**
		F < 60

GROUP TERM PROJECT GUIDELINES:

- Groups of 4-6 members will be chosen randomly by the instructor.

- Topics for the group term project will be assigned by the instructor. The term project is worth **20%** of the course overall grade. All class members must participate in the research task and presentation.

- The **mandatory** "Self & Peer Evaluation Form" (posted on CANVAS and the course website) is due on **27-Apr-2025 by 11:59 pm (PST)**. Submitting the form is 100% required by all class members. The form should be "**typed**" and **not** hand-written or scanned. Students will individually and confidentially submit the form in **PDF** via a special link made available in the course module on CANVAS.

- The professionally-done PPT file (one upload per group!) is due on **27-Apr-2025 by 11:59 pm (PST)**. A complete write-up report is not required. Each group leader/facilitator shall upload the PPT file via s special link to be made available in the course module on CANVAS. **The PPT** must contain **30** slides (**no more or less**) and should be done professionally. The presentation must be informative, creative, rich, insightful and reader-friendly.

- The presentation should be comprehensive covering **all** aspects of the assigned topic/project. Follow the "Oral Presentations Rubric" that is posted on the course webpage and on CANVAS. Submissions that do not conform to the above format will not be accepted.

- The in-class showcase presentations will take place from **April 28th till May 5th**. **Specific groups will present on specific days.**

- All students **must** attend **ALL OF THE GROUP PRENSENTIONS**, else a **25%** grade reduction (to the term project's grade weight) will be imposed for each missed presentation.

Important Note: All group members must participate equally time-wise in the class presentation. Students who do not present will be issued a ZERO for the term project.

It is a fundamental principle of academic integrity that the authorship of the intellectual content of works submitted as part of a class assignment must be fairly represented. Contributions of language and thought must be appropriately credited.

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Academic Dishonesty:

Academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form at California State University Northridge. All students involved in academic dishonesty will be disciplined in accordance with university regulations and procedures. Discipline may include suspension and/or expulsion from the University.

"Cheating or plagiarism in connection with an academic program at a CSU campus is listed in Section 41301, Title 5, California Code of Regulations as an offense for which a student may be expelled, suspended or given a less severe disciplinary sanction.

Academic dishonesty is an especially serious offense and diminishes the quality of scholarship and defrauds those who depend on the integrity of the University's programs." Please consult university policy regarding plagiarism and the consequences.

https://catalog.csun.edu/policies/academic-dishonesty/

Any student caught cheating or plagiarizing in this class will receive a zero for the assignment and may be referred to the dean's office for additional consequences.

Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person. The instructor reserves the right to submit your papers to turnitin.com for identifying papers containing unoriginal material.

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For Your Information: Grade Evaluation Criterion

*** 'A' grade range (A to A-) is reserved for work that is exceptional. This means that it (1) is professional and reflects the writer's/s' careful consideration of audience and purpose; (2) shows perfect to near-perfect understanding of the necessary concepts and analytical tasks; (3) where appropriate, it shows the capacity to think creatively or to see implications beyond the immediate scope of the question; (4) contains all necessary information (invention); (5) is arranged in a logical manner (6), is memorable; (7) delivery is visually appealing; and (8) is free of mechanical errors and is formatted as specified. Work must be flawless to attain an A/A-. Work with minor flaws that is nonetheless excellent in other ways will earn an A-.**

*** A grade in the B range means that the work is acceptable at the graduate level (B- range) to very good (B/B+). This work satisfies all (B+) or most (B/B-) of the requirements of the question & research tasks, shows the capability to think beyond the task by relating it to other areas of knowledge in or outside of the course; is neatly presented and shows above-average use of academic English. If the work is decently written, is formatted basically correctly, and covers most of the required content, but has several minor flaws or one major flaw, the grade is B-.**

*** A grade in the C range means that the work, while covering much of the required ground, does not show graduate-level analytic and expressive ability. That is, major and minor items may be missing or incorrect; and while the language may communicate most points adequately, it does not qualify as above-average academic work.**

*** A grade in the D range shows that the work does not, overall, achieve an acceptable level of coverage of the requirements AND/OR the language is insufficient to make the writer's points understandable to the reader. The content may be either incorrect to an unacceptable degree, or very incomplete.**

*** A grade of F indicates that so little of the required content is covered that grading the paper is an exercise in futility. It may mean that very major points have clearly not been grasped or have been misunderstood by the student. An F may also indicate that the ideas are expressed in such a way that they are not at all understandable to the reader. A grade of F is also awarded when assigned work is not handed in, or not handed in by the set deadline.**

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