# MIDWESTERN STATE UNIVERSITY
# DEPARTMENT OF COMPUTER SCIENCE
CMPS 4883-5333: Modeling & Simulation
Spring semester 2022

Instructor: Dr. Nelson L. Passos
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Office Hours: MW 9:00 - 11:00 am
TR 9:30 - 12:00 pm
1:00 - 3:00 pm
Class Hours: TR 8:00 am – BO 320

**Course Description**:

Topics in design, implementation, and analysis of computer-based discrete event simulations, including methodology, verification and validation. May include the use of special purpose languages and tools.

**Text book:**

Discrete Event System Simulation, by J. Banks, J. Carson, B. Nelson and D. Nicol.

**Grading:**
Test/final: 25 % (each)
Mini-Projects/report: 20 %
Assignments: 25 %
Class Participation: 5 %

Final grading letter:
90 to 100 pts = A, 80 to 89.99 pts = B, 70 to 79.99 pts = C, 60 to 69.99 pts = D, other = F

**Additional and important information:**
All students should refer to the current MSU Students Handbook and Activities Calendar for university policies related to class attendance, academic dishonesty, students responsibilities, rights and activities.

Disability needs: Inform the instructor if you are a student with a disability and need accommodations for this class.

Cell phones, etc.: Use of any electronic device is not allowed in the classroom. Exceptions must be approved by the instructor.

Student drops: If you wish to drop this course you must first contact your instructor. All students-initiated drops must be processed by **March 21, 2022**.

Attendance:  **Students are expected to attend all meetings of the classes in which they are enrolled.** In case of virtual classes, attendance will be verified by online participation. Attendance is rewarded by the participation points in the grading criteria.

Campus Carry: Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage at https://mwsu.edu/campus-carry/rules-policies.

Assignments: Assignments will be made as scheduled and are expected to be completed by the specified due date. Grades will be given to the assignments handed in on time. Late assignments will be accepted until one class past the due date, however will have their maximum grade reduced by twenty points.  Any assignment turned in after that period or not done will be graded zero points. Students in this course must demonstrate their competency in fundamentals math skills through homework assignments and tests.
Assistance:   Please contact your instructor for extra help during this course. This includes class material clarification, expected absences from class due to any personal problem, etc.

Academic Honesty: The Department of Computer Science had adopted the following policy related to cheating (academic misconduct).  The policy will be applied to all instances of cheating on assignments and exams as determined by the instructor of the course.
- 1st instance of cheating in a course: The student will be assigned a non-replaceable grade of zero for the assignment, project or exam.  In addition, the student will receive a one-letter grade reduction in course.
- 2nd instance of cheating in a course: The student will receive a grade of F in course & immediately be removed from course.

All instances of cheating will be reported to the Department Chair and, in the case of graduate students, to the Department Graduate Coordinator.

Testing Process
The Department of Computer Science has adopted the following policy related to testing:
- All bags, purses, electronics (turned off), books, etc. will be placed in the front of the room during exams, or in an area designated by the instructor.
- Unless otherwise announced by the instructor, nothing is allowed on the desk but pen/pencil/eraser and test papers.
- No student is allowed to leave the room during an exam and return

Midterm Progress Report: In order to help students keep track of their progress toward course objectives, the instructor for this class will provide a Midterm Progress Report through each student's WebWorld account.  Midterm grades will not be reported on the students' transcript; nor will they be calculated in the cumulative GPA. They simply give students an idea of where they stand r.  Students earning below a C at the midway point should schedule a meeting with their instructor.

RECORDING OF CLASS LECTURES: Permission must be requested in writing & obtained from the instructor before recording of class lectures. If permission is granted, the recording may only be used by the student making the recording.  Recordings may NOT be posted on any internet source without written permission of the instructor. Failure to adhere to the policy may result in removal from the course with a grade of F or other appropriate punishment.

Grades will be posted on D2L

# Tentative agenda:

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|---|---|
| **Jan 11-** | Introduction to Discrete Event Simulation |
| **Jan 13-** | Types of models |
| **Jan 18-** | Uses of simulation |
| **Jan 20-** | Random numbers |
| **Jan 25-** | Excel review |
| **Jan 27-** | Using Microsoft Excel |
| | Assignment # 1 |
| **Feb 1-** | Basic examples – coin tossing |
| **Feb 3-** | Monte Carlo |
| | Assignment # 2 |
| **Feb 8-** | Basic examples – Random Service Times |
| **Feb 10-** | Basic examples – Random Arrival Times |
| | Assignment # 3 |
| **Feb 15-** | Queueing simulation |
| **Feb 17-** | Basic examples – Grocery Checkout |
| **Feb 22-** | Basic examples – Call center |
| **Feb 24-** | **Test # 1** |
| **Mar 1-** | Inventory simulation |
| **Mar 3-** | Other examples |
| **Mar 8-** | Distribution - review |
| **Mar 10-** | Basic examples – A Bombing Mission |
| | Assignment # 4 |
| **Mar 15-17** | **Spring Break** |
| **Mar 22-** | Lead time - implementation |
| **Mar 24-** | Concepts of Discrete Event Simulation |
| **Mar 29-** | Time advance algorithm |
| **Mar 31-** | Manual simulation |
| | Assignment # 5 |
| **Apr 5-** | Dump truck operation |
| **Apr 7-** | Multistep processes |
| | Assignment # 6 |
| **Apr 12-** | Verification and Validation |
| **Apr 14-** | **Easter Break** |
| **Apr 19-** | Accreditation |
| **Apr 21-** | Dynamic methods |
| **Apr 26-** | Lists in DES - arrays |
| **Apr 28-** | Linked lists |
| **May 3-** | **Finals (Thursday, 8:00 am)** |