Formal Methods and Models (CS 330) - Spring 2020

- **Professor**: Carlotta Domeniconi, Rm 4424 ENG, carlotta@cs.gmu.edu or cdomenic@gmu.edu, Office hours: Monday and Wednesday 1:30PM - 2:30PM.

- **Teaching Assistant**: Bahman Pedrood, Rm 4456 ENG, bpedrood@masonlive.gmu.edu, Office hours: TBD.

- **Prerequisites**: CS211 and Math125 (C or better in both). Exposure to Discrete Mathematics (as in MATH125) is important for success in this course.

- **Textbook**: Hamburger and D. Richards, *Logic and Language Models for Computer Science*, Third Edition 2017.

- **Syllabus and Link to Schedule of Classes**:
  cs.gmu.edu/∼carlotta/teaching//CS-330-s20/info.html

General Description

This course is an introduction to two kinds of formal systems - languages and logics - that are crucial to large numbers of areas in computer science. The study of formal languages underlies important aspects of compilers and other language processing systems, software engineering, agents and multiagent systems, game development, robotics, and networking. Formal logics and automatic reasoning are put to use in artificial intelligence, database theory, and software engineering. The course gives students practice in precise thinking and proof methods that play a role in the analysis of algorithms.

List of Topics

- Propositional Logic and Proofs

- Predicate Logic and Proofs

- Program Verification

- Finite State Automata

- Regular Expressions

- Context-Free Grammars

- Push-down Automata

- Turing Machines and Solvability

Grading

- Quizzes: 25%

- Assignments: 15%

- Midterm + Final: 60%. Highest score counts 35%. Lowest score counts 25%

Quizzes and exams are closed book. One sheet of notes allowed for exams only. No notes allowed for quizzes. The lowest quiz grade will be dropped. Assignments must be performed individually. Group work is NOT allowed. Any deviation from this policy will be considered a violation of the GMU Honor Code.

No Late assignments will be accepted.

Beside graded homeworks (one problem per-week), additional practice homeworks will be given and will not be graded.

No make-up quizzes will be offered!

IMPORTANT: In order to receive a passing grade in this class, each student will also meet at least once with their academic advisor during the semester.

PIAZZA: We use Piazza to communicate. Technical questions, and questions in general about the material discussed in class, should be posted on Piazza. Clarifying questions on assignments should also be posted on Piazza. Do NOT post your assignment solutions on Piazza. Do NOT use email for technical questions. Your questions are likely to be of interest to other students as well! Come see me or the GTA during office hours to discuss in person. If you do send me an email, you are required to use your mason account to communicate with me. I maintain a course webpage with the schedule of classes. Assignments and readings will be posted on the Schedule of Classes. Further instruction on how to submit assignments will be provided.

Grades are posted on Blackboard.

Communication: Always use your GMU email account to communicate with me. Always label your email as "CS 330: ...". Both "carlotta@cs.gmu.edu" and "cdomenic@gmu.edu" are valid email addresses to reach me.
Important Dates:

- **Monday, March 16**: Midterm

- **Monday, May 11**: Final

- **Each Wednesday**: Quiz! **First Quiz on January 29!** A quiz always covers the material discussed in class **the week before**.

- **Each Wednesday**: Homework assignment (and practice exercises) OUT! **First assignment OUT Wednesday January 22! Due the following Monday before class starts!**

Please, no laptops in class. This is a firm rule, and includes phones, tablets, and electronics in general! Without these distractions, you'll have a superior learning experience during lectures. Regular attendance is highly recommended!