Formal Methods and Models (CS 330) - Fall 2018

- **Professor**: Carlotta Domeniconi, Rm 4424 ENG, carlotta@cs.gmu.edu or cdomenic@gmu.edu, Office hours: Thursday 2-4PM.

- **Teaching Assistant**: Wanwan Li

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

- **Location and Time**: We meet in Sandbridge Hall 107, TR noon - 1:15pm

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

- **Course Web Page**: http://www.cs.gmu.edu/∼carlotta/teaching//CS-330-f18/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. Programming assignments in Prolog and other programming languages provide practical experience with these theoretical topics.

List of Topics

- Propositional Logic and Proofs (weeks 1/2)

- Predicate Logic and Proofs (weeks (3/4)

- Program Verification (week 5)

- Prolog (week 6)

- Finite Automata (weeks 8/9)

- Regular Expressions (weeks 10/11)

- Context-Free Grammars (weeks 12/13)

- Turing Machines and Solvability (week 14)

Grading

- Quizzes: 20%

- Programming Assignments: 20%

- Midterm: 30%

- Final 30%

Quizzes and exams are closed book. One sheet of notes allowed for exams. The lowest quiz grade will be dropped. Programming 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.

Late assignments: 10% penalty for each day. MAX 5 days of delay.

Practice homeworks will be given (not 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 will set up a Piazza account for this class. To be used for questions on material covered in class, clarifying questions on practice exercises and assignments. However, you should always refer to the class webpage for announcements and updates.

I do **NOT** use Blackboard for this class.

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:

- **Thursday, October 11**: Midterm

- **Thursday, December 13**: Final, 10:30AM - 1:15PM

- **Each Thursday**: Quiz! **First Quiz on September 6!**

Please, no laptops in class. I am saying please, but this is a firm rule, and includes phones, tablets, and electronics in general!