Logical Foundations of CS	**Syllabus**	**Spring 2020**
CS 5303/6303	TR 3:00pm to 4:20pm	CCSB 1.0204

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Prerequisites: An exposure to mathematical proofs and reasoning like that covered in discrete mathematics or discrete structures.

Brief course description: This course provides a review of the fundamental logical tools required in advanced computer science including topics such as propositional and first-order logic, proofs, program verification.

Learning objectives: The objective of this course is for students to become aware of the importance of logical components and proofs in the solutions they design to common problems. By the end of the semester, the students will be able to understand how logic and proofs can help them design better solutions to their problems. They will have become more knowledgeable about program verification and proofs of their solutions. They will also have gained experience in logic programming (prolog and related programming languages) through the work spent working on their individual projects.

Suggested Readings:

1. Logic in Computer Science: Modelling and Reasoning about Systems, by Michael Huth and Mark Ryan, 2004

2. Introduction to Mathematical Logic, by Elliott Mendelson, Fifth Edition, CRC Press.

3. Mathematical Logic for Computer Science (Series in Computer Science), by Lu Zhongwan, 1999

4. Sets, Logic and Maths for Computing (Undergraduate Topics in Computer Science), by David Makinson

5. The Nuts and Bolts of Proofs, Third Edition: An Introduction to Mathematical Proofs, by Antonella Cupillari

6. How to prove it: a structured approach, by Daniel Velleman

7. From Logic to Logic Programming, by Kees Doets, 1994.

8. The Science of Programming, by David Gries, 1981.

Examinations: There will be two examinations, including one midterm exam and one comprehensive final. All exams will cover the lecture notes and assigned/directed reading, and class discussion. It is important that students take the exams at the assigned time. If an exam must be missed, the instructor should be contacted prior to the class period. Make-up exams must be completed within one week. After the exam is returned to you graded, if you have questions about the grading, you have one week to ask for it to be revised. In addition, there will be unannounced quizzes and some homework during the semester. There will be no make-up quizzes.

Major assignments During the semester, you will have to work on a project. Project topics will be decided during the first weeks of classes, and no later than the end of week 3, and you will then work on your own project until the end of the semester. The project is to be done individually and will consist of some problem to study, for which a solution, involving logical components, will be implemented. Project topics may be chosen in concert with the student's research advisor if applicable and relevant. Over the course of the semester, you will have to turn in several deliverables related to your project, including: an article summary (as related to your project), a state-of-the-art in the area of your project as it relates to logic, a report outline. Note: out of courtesy to your instructor, all written homework assignments should be typed and free of typos (as much as possible: for instance, turning in a document that is all underlined in red – if an office document – or full of errors anyway is not acceptable and will be returned without comment or grade).

Class participation: Active participation is expected in this class. A total of 5% of your final grade are allocated to participation, which will be graded based on:

- Attendance

- General attitude, including arriving and leaving on time

- Your contribution to class discussions and exercises

- Completion of assigned homework on time.

Grading

Determining grades. Grading scale for examinations and course work:

- A 90% to 100%

- B 80% to 89%

- C 70% to 79%

- D 60% to 69%

- F below 59%

Final grades will be based on the following:

- Mid-term examination 20%

- Comprehensive final 25%

- Deliverables related to project 15%

- Final project 20%

- Quizzes and homework 15%

- Class participation 5%

Important passing condition: Regardless of your overall average grade at the end of the semester, failing the comprehensive final (with a D or an F) will result in your failing the class. The same goes for your project: failing the project (with a D or an F) or failing to turn it in (on time or at all) will result in your failing the course.

Attendance Class attendance and participation is vital. Information will be shared in the class sessions that will help the students work on their projects and succeed in their exams. Excessive absences will have an adverse effect on a student's final grade. If you need to be absent, you are allowed to two personal days: the instructor needs to be informed about your absence before it happens. More than two absences will be considered excessive and will result in loss of participation points.

Policies

Academic dishonesty: It is UTEP's policy, and mine, for all suspected cases or acts of alleged scholastic dishonesty to be referred to the Office of Student Conduct and Conflict Resolution for investigation and appropriate disposition. See Section II.1.2.2 of the Handbook of Operating Procedures.

Late work: Any assignment turned in after the class in which it is due starts will be considered late. Quizzes (possibly unannounced) will often be given at the beginning of the class period. There will be no extra time for students who arrive late in class. Major assignments will be penalized by one letter grade per day that it is late (starting the first day after the class starts). There will be no exception to this rule.

Communication: It is extremely important that all students understand that they should seek help or let the instructor know about special circumstances as soon as they arise. This way, if any special treatment or advice is necessary, the chances to resolve a problem are higher.

Courtesy: We all have to show courtesy to each other, and the class as a whole, during class time. Please arrive to class on time (or let me know when you have to be late, and why); do not engage in side conversations when one person (me, or another student) is talking to the whole class; turn off your cell phone (or, for emergencies, at least set it to not ring out loud), and do not engage in phone, email, or text conversations during class.

Disabilities: If you have, or suspect you have, a disability and need an accommodation, you should contact the Center for Accommodations and Support Services (CASS) at 747-5148, cass@utep.edu, or Union East room 106. You are responsible for presenting to me any CASS accommodation letters and instructions.

Exceptional circumstances: If you anticipate the possibility of missing large portions of class time, due to exceptional circumstances such as military service and/or training, or childbirth, please let me know as soon as possible.