

# Logical Foundations of Computer Science

## CS5303 Spring 2011 – Syllabus

### General information.

Instructor: Dr. Martine Ceberio

Office: CS 202C

Office hours: TR 12:15 pm – 1:15 pm and 3:00 pm to 3:30 pm, or by appointment

Meeting times: TR 1:30 pm – 2:50 pm

E-mail: [mceberio@utep.edu](mailto:mceberio@utep.edu)

Website: <http://www.martineceberio.fr/teaching>

### Textbooks (required).

1. Mathematical Logic for Computer Science (Series in Computer Science), by Lu Zhongwan, 1999
2. Logic in Computer Science: Modelling and Reasoning about Systems, by Michael Huth and Mark Ryan, 2004

### Other materials / recommended reading.

1. Introduction to Mathematical Logic, by Elliott Mendelson, Fifth Edition, CRC Press.
2. Sets, Logic and Maths for Computing (Undergraduate Topics in Computer Science), by David Makinson
3. The Nuts and Bolts of Proofs, Third Edition: An Introduction to Mathematical Proofs, by Antonella Cupillari
4. How to prove it: a structured approach, by Daniel Velleman

Articles will also be provided to students as additional reading and, at some point, as an assignment: analysis and presenting the material described in the article to the rest of the class.

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### 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 solution 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 in their individual projects.

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### Examinations.

There will be two examinations, including one midterm exam and one comprehensive final. All exams will cover the textbooks chapters, assigned readings, lecture notes, and class discussion. It is important

that you take the exams at the assigned time. If you miss an exam, contact the instructor **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.

*Tentative dates for examinations:*

- Mid-term examination: Tuesday March, 1<sup>st</sup>
- Final examination: Tuesday April, 12<sup>th</sup>

*Extra-credit:* There will be some extra credit in each exam as well as some extra-credit quizzes or assignments over the course of the semester. Important information: there will be no extra credit provided after week 14.

### **Major assignments.**

During the semester, you will be given one research article to analyze and present to the class, as well as one project.

The article will be given individually: each student will be given a different article to study. Each student will have to fully understand the content of the article and to present it to the class as if they were teaching the other students the content of the article. Material necessary for the classmates to better understand the content of the article should be prepared as well and handed-out right before the presentation.

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.

*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).

### **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.

### **Determining grades.**

Grading scale for examinations and course work:

A	85% to 100%
B	75% to 85%
C	65% to 75%
D	55% to 65%
F	below 55%

**Final grades will be based on the following:**

Mid-term examination	20%
Comprehensive final	25%
Article analysis and presentation	10%
Quizzes and homework	15%
Project	25%
Class participation	5%

For the ease of communicating grades or assigning work, each student will be assigned a letter code at the start of the semester. It is the responsibility of each student to get to know their letter code by the end of Week 2 and not to forget it. In case a student does not remember his/her letter code, s/he will have to get it back in person at the instructor's office: no letter code will be given back via email.

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

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### **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.

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### **Standards of Conduct.**

You are expected to conduct yourself in a professional and courteous manner, as prescribed by the UTEP Standards of Conduct.

Graded work, e.g., homework and tests, is to be completed independently (unless specified differently) and should be unmistakably your own work (or, in the case of group work, your team's work), although you may discuss your project with other students in a general way. You may not represent as your own work material that is transcribed or copied from another person, book, or any other source, e.g., a web page. Professors are required to – and will – report academic dishonesty and any other violation of the Standards of Conduct to the Dean of Students.

### **Disabilities.**

If you feel that you may have a disability that requires accommodation, contact the Disabled Student Services Office at 747-5184, go to Room 106E Union, or email [dss@utep.edu](mailto:dss@utep.edu).

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### **Classroom policies and conduct.**

- You are expected to be on time. Do not come to class late or leave early as this unfairly disrupts your classmates. Arriving late or leaving early will also have an adverse effect on your success in the class as you are likely to miss quizzes (for which no make-up will be provided), miss

important information that you will be responsible to get back on your own. There will be no repetition of courses for students who arrive late or leave early.

- You are expected to spend the whole class period in class: please attend the rest room or any other need before the class. Exceptions should be approved before the class period starts.
- You are expected to do your class work and come prepared to class. Homework and any assignments will be due at the beginning of the class period. Failing to turn in assignments on time will result in points off.

**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.

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**I have read the syllabus and all rules it includes. I understand them all and commit to follow them.**

**NAME (print):**

**Date:**

**Signature:**

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