

22C:135 Theory of Computation syllabus

Teodor Rus

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The University of Iowa, Department of Computer Science



Schedule

Instructor: Teodor Rus

Office: 201J MLH, Phone: 319-335-0742

OfficeH: MWF 9:30am–10:30am, 201J MLH

Class hours: MWF 10:30–11:20, 221 MLH

Web site:

<http://www.cs.uiowa.edu/~rus/Courses/Theory/index.html>



Methodology promise

- Make it acceptable and useful for undergraduates
- Make it acceptable and complete for graduates
- Make it funny for both.

Note: We will cover all the material specified in the course description.



Teaching and learning

I plan on keeping the following structure of every lecture:

1. Informal presentation of the topic of interest
2. Formalizing the topic of interest
3. Illustrating the topic of interest by in-class problem solving

Note: Use office hours (held by the instructor and TA) to improve learning process



Assessment

- One midterm in-class exams, covering material not yet tested up to the exam date. See syllabus for the midterm date.
- One final exam that is comprehensive and mandatory. See syllabus for the final date.
- Assignments a rhythm of one every other two weeks
- Class attendance (5–10 minutes quizzes randomly at the beginning of the class) and class contribution (by in-class problem solving or topics presentation).



Class contribution

- Volunteer to solve problems that illustrate the topic presented in class.
- Select topics of interest (ex: hyper computation), seek instructor approval, set a class presentation time, present topic to the class.
- Implement algorithms presented in class and provide them as bonus work.



Textbooks

- Michael Sipser, *Introduction to the Theory of Computation*, PSW Publishing Company 2006.
- Arthur Fleck, *Formal Models of Computation*, World Scientific 2001, AMAST Series in Computing, Vol 7.



Note

Since Theory of Computation is at the core of our profession these books should be in everybody's private library.

However:

- I do know that these are expensive books and I will try to help putting my lecture notes on the web.
- But lecture notes are good for understanding while a textbook may help in many other ways.
- Put Formal Models of Computation in reserve in the Math Library.



Student assessment

The total number of points accumulated by a student during the semester will be transformed into student's score, by the following formula:

$$\text{Score} = (25\text{MidT} + 30\text{Final} + 30\text{Assigns} + 15\text{InClass})/100$$

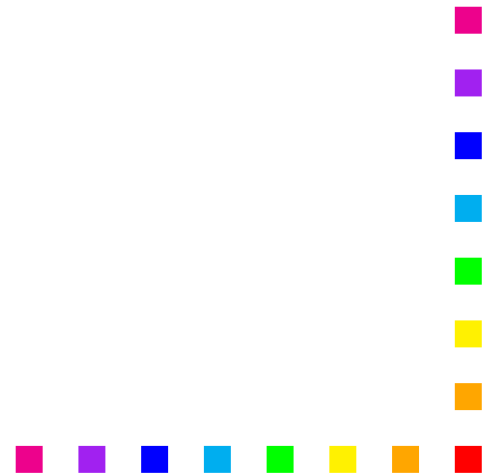
That is, the Score is an averaged sum of the

1. MidT, (25% of the midterm exam score)
2. Final, (30% of the final exam score)
3. Assigns, (30% of the score in the assignments)
4. InClass (15 % of the score obtained from in-class contribution).



Note

I plan on giving you approximatively one assignment every other two weeks



In-class contribution

measures the students interest in this class by

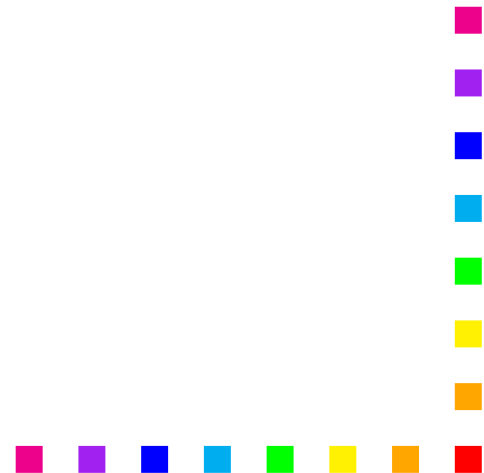
- Lecture presentations by students on student's topics of interest.
- Contributions to problem solving performed during class time.
- Quizzes at unpredictable times that check students presence and their interest in the class.



Bonus work

Work done outside of the four categories described above.

Bonus work consists of solving difficult problems and implementing various algorithms on the computers available in the department.



Bonus work submission

1. A bonus work problem can be proposed by the instructor during class time or by the student during or outside class time.
2. In order to be considered for bonus, a problem needs to be:
 - (a) Formulated mathematically by the student and discussed with the instructor.
 - (b) Once approved as bonus, the problem and its solution need to be written on an file that must be readable using computer tools available to the instructor.
Suggestion: use Latex to develop this text file and email the source or the pdf to the instructor.
3. The due date of a bonus problem is two weeks after its approval; the grading of the solution is done by the instructor; contribution toward student's grade will be known only after the final exam.
Note: bonus work cannot have negative effect on student's grade.



Note

- While exams, assignments, and in-class contribution will be graded by the TA and instructor, the bonus work will be graded by the instructor and the score will be added to the student's final Score.
- While exams, assignments and in-class contribution are mandatory (i.e., if you miss one you get zero points) the bonus work is voluntary. It can only help, it never hurts.



Grading Procedure

The student grade in this class will reflect student's work in the class.

- No curving will be applied in the determination of your final grade.
- If all students deserve an A all will get it, and this is what I expect. Therefore at the beginning of the class every student receives an A in this class. It is student's task to keep it.



Letter grade

The letter grades will be determined as follows:

- An A is obtained if $90 < \text{Score} \leq 100$.
- A B is obtained if $70 < \text{Score} \leq 90$.
- A C is obtained if $50 < \text{Score} \leq 70$.
- A D is obtained if $30 < \text{Score} \leq 50$.
- An F is obtained if $0 \leq \text{Score} \leq 30$, or if the student does not attend the final exam.

Note: These ranges are not absolute. However, the lower limits will not be raised any higher; + and - will be used along with the letter scores in the final result.



Teaching assistant

TA and TA's office hours will be determined later.

Good luck!

