

# CS584: Theory of Computation and Computational Complexity

Gopal Pandurangan  
gopal@cs.purdue.edu  
Office: CS128

TA: Deepak Bobbarjung  
drb@cs.purdue.edu  
Office: CSG64

webpage:[www.cs.purdue.edu/homes/gopal/cs584](http://www.cs.purdue.edu/homes/gopal/cs584)  
newsgroup: [purdue.class.cs584](mailto:purdue.class.cs584)  
WebCT: [webct.ics.purdue.edu](http://webct.ics.purdue.edu)

# Course Outline

- Introduction: Problems and Algorithms
- Turing Machines
- Computability
- Logic: Boolean, First-Order, Undecidability
- Time and Space Complexity Classes; P and NP
- Reductions and Completeness
- Randomized Computation and Complexity
- Approximation Algorithms and Approximability
- More ...

# References

**Text:** Computational Complexity by Papadimitriou.

Lecture Slides (will be posted at WebCT).

Documents/papers posted in the course webpage and WebCT.

# Grading

Assignments (20%):

- Individually written - **non collaborative**.
- Must be in Latex.
- Work **must** be submitted on time.

Midterm - 40% and Final - 40%.

**Academic Dishonesty policy:** All submitted work should be on your own. Copying or using other people's work (including from the Web) or using unauthorized material (the text, lecture slides, class notes, and papers/documents posted at the course webpage and WebCT) are the only material allowed) will result in  $-MAX$  points, where  $MAX$  is the maximum possible number of points for that assignment. Repeat offense will result in getting a failure grade in the course and reporting to the Dean of students.