

THE UNIVERSITY OF TEXAS AT EL PASO
COLLEGE OF SCIENCE
DEPARTMENT OF Mathematical Sciences

Course #: CPS 5401, CRN 16030
Course Title: Introduction to Computational Sciences
Credit Hrs: 4
Term: Fall 2009
Course Meetings & Location: 6:00 pm - 8:00 pm, TR Bell Hall 130, Aug 24, 2009 - Dec 03, 2009
Prerequisite Courses: Instructor approval
Course Fee: (if applicable)
Instructor: Andrzej Pownuk
Office Location: Bell Hall 201
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Emergency Contact # 915 667 0478
WWW # <http://andrzej.pownuk.com>
Office Hrs: M 3 pm - 4 pm, TR 4 pm-5 pm
Textbook(s), Materials: Required: George Em Karniadakis and Robert M. Kirby, Parallel Scientific Computing in C++ and MPI: A Seamless Approach to Parallel Algorithms and Their Implementation, Cambridge University Press, 2003
Suggested: M.J. Quinn, Parallel Programming in C with MPI and Open MP, TATA McGraw-Hill, 2004
William H. Press, Saul A. Teukolsky, William T. Vetterling, Brian P. Flannery, Numerical Recipes: The Art of Scientific Computing, Cambridge University Press
The Sourcebook of Parallel Computing, Edited by Jack Dongarra, Ian Foster, Geoffrey Fox, William Gropp, Ken Kennedy, Linda Torczon, Andy White, October 2002, 760 pages, ISBN 1-55860-871-0, Morgan Kaufmann Publishers
Course Objectives (Learning Outcomes): There will be four major aspects of the course:

- Part I will start with a practical short description of UNIX, scientific programming using high level languages, message passing interface, and current trends in high performance computing.
- Part II will be on solvers: both iterative for the solution of sparse problems, and direct for dense matrix problems. Algorithmic and practical implementation aspects will be covered.
- Part III will illustrate the modeling of problems from physics and engineering in terms of partial differential equations (PDEs), and their numerical discretization using finite difference, finite element, and spectral approximation

Course Activities/Assignments: Several project will be assigned.
<http://webapp.math.utep.edu/Homework/Login.aspx>
Assessment of Course Objectives: The final grade is equal to the average grade form all projects and homework (70% projects, 30% homework).

Course Schedule:

Grading Policy: Final grade = $0.7 * (\text{grade for projects}) + 0.3 * (\text{grade from homework})$

Make-up Policy: It is possible to make up the projects.

Attendance Policy: As with every college course, attendance is essential for success. Even though there is no attendance policy, please try not to be absent unless absolutely necessary.

Academic Integrity Policy: <http://academics.utep.edu/Default.aspx?tabid=23785>

Civility Statement: No cell phones are allowed to be used during the class, quizzes, tests or exams. Please turn off any electronic device which may disturb the class activity.

Disability Statement: If a student has or suspects she/he has a disability and needs an accommodation, he/she should contact the Disabled Student Services Office (DSSO) at 747-5148 or at dss@utep.edu or go to Room 106 Union East Building. The student is responsible for presenting to the instructor any DSS accommodation letters and instructions.

Military Statement: If you are a military student with the potential of being called to military service and /or training during the course of the semester, you are encouraged to contact as soon as possible