

MATHEMATICS DEPARTMENT, UNIVERSITY OF MASSACHUSETTS DARTMOUTH
High Performance Scientific Computing
EAS 520 – Section 01 – Spring 2015
Course Information and Syllabus
Updated February 3, 2015

Instructor: Akil Narayan
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Office hours: Tues 2-4pm, Thurs 9-11am, Wed 12-2pm (Wed only by appointment)
Office hours location: LARTS 394C

Class time and location: TTh, 12:30pm-1:45pm, LArts 218

Section webpage: <http://www.math.umassd.edu/~anarayan/eas520>

Text: There are no required texts. Instead, there will be links to reference material posted on the class website.

Learning objectives: This course is one of graduate level courses offered by the Engineering and Applied Science PhD program at UMass Dartmouth. We will be covering selected topics in scientific computing as case studies; these topics include embarrassingly parallel problems, matrix vector multiplication, systems of linear equations, domain decomposition, Monte-Carlo-type simulations, and Poisson solvers. Students will learn parallel and distributed computing techniques, partitioning and load balancing, shared and distributed memory models, and message passing.

Prerequisites: EGR 301. I will assume you are comfortable with the basics of multivariate differential and integral calculus, linear algebra, eigenvalue problems, ordinary differential equations, and Fourier series.

Course description: Course covers an assortment of topics in high performance computing (HPC). Topics will be selected from the following: parallel processing, computer arithmetic, processes and operating systems, memory hierarchies, compilers, run time environment, memory allocation, preprocessors, multi-cores, clusters, and message passing.

Projects: Your grade in this course will be *entirely* determined by projects. Generally you will have at least two weeks to complete each of these projects. There will be significant in-class time devoted to working on projects. There will be absolutely *NO* extensions of due dates for projects, except in extenuating circumstances with accompanying documentation.

I encourage you to consult with your peers when working on the projects. However, each student must turn in his or her own work, and plagiarism will not be tolerated.

Class structure: The goal of this class is to let you practice programming and computing techniques. The class meets twice a week, and generally one of these meetings will be earmarked as time for you to work on projects individually, or in consultation with peers or the instructor.

Attendance: I do *not* take attendance; attendance at class meetings is not a factor in your grade. However, you are responsible for your own awareness of any course policies and practices that are announced in class. Since much of the class meeting time will be devoted to work on projects, there is little reason to not attend all class meetings.

If you believe you will be absent for an extended period of time due to illness or other emergency, notify me immediately to arrange make-up of any assignments that will be missed. In agreement with other class policies, no assignments or evaluations can be ‘made up’ after an absence, except in extenuating circumstances.

Incomplete grades An incomplete grade will be given only in exceptional circumstances at my discretion. You must be passing the class at the time of the request for an incomplete grade, or be sufficiently close to passing. If the work is not completed within one year of the recording of the incomplete grade, the grade will become an F(I). The incomplete policy for this course is that at least 70% of the course must be already completed and an exceptional circumstance (i.e. medical issue) must exist. If you feel you require an incomplete for an exceptional reason, you need to email me and state your reasons for the incomplete in writing. We will then schedule a meeting and decide how to proceed.

Grading: Your course grade will be computed as follows.

- Projects 100%

Important dates:

Feb 5 Last day to add, drop, or audit a course
Feb 26 Last day to file courses for pass/fail credit
Apr 8 Last day to withdraw from a course

Class communication: An email list is set up with which I shall send out information not communicated during class. This email list will also be used to communicate class information in the case of unusual circumstances affecting the the logistics of the class. If you are not officially registered for the class but wish to be on the roster, please discuss it with me.

If you are registered for the course, but do not receive the course email announcements to your UMassD email address, please notify me immediately. It is not possible for me to arrange delivery of these emails to a non-UMass account.

The section website will also be used to communicate more technical matter of the class (e.g. homework assignments, lecture summaries, etc.).

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to change that may be necessitated by a revised semester calendar or other circumstances. The above two methods, in addition to the coursewide website, are reliable means of getting information about changes to the course.

Students with disabilities: If you have a documented disability and require accommodations to obtain equal access in this course, please meet with me at the beginning of the semester and provide the appropriate paperwork from the Center for Access and Success. The necessary paperwork is obtained when you bring proper documentation to the Center for Access and Success, which is located in Woodland Common, Room 111. Tel: 508-999-8711.

Academic Integrity: I'd like to remind you of UMass Dartmouth's code of academic integrity [1].

I am a trusting person and will generally give a student the benefit of the doubt, but if I deem a situation as a blatant attempt to circumvent ethical standards, I will pursue appropriate actions at the university level. In addition, a failing grade for the class is a standard penalty in such cases.

[1]: <https://www.umassd.edu/policies/activepolicylist/academicaffairs/academicintegritypolicyandreportingform/>