Course Syllabus  
ENGI 6397  
Introduction to High Performance Computing for Engineers and Scientists

<table>
<thead>
<tr>
<th>Term</th>
<th>Spring 2019</th>
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<tbody>
<tr>
<td>Lectures Time &amp; Location</td>
<td>MREB Building, 2nd floor, room 200. 11:30AM - 1:00PM M/W</td>
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</tbody>
</table>
| Instructors | Dr. Jerry Ebalunode  
Dr. Martin Huarte-Espinosa |
| Emails | jebalunode@uh.edu  
mhuartee@central.uh.edu |
| Offices | MREB 205M & MREB 205J |
| Office hours | Dr. Huarte-Espinosa, 2:30PM - 3:30PM T/TH  
Dr. Ebalunode, 2:30-3:30PM M/W |

Course description:  
This graduate level course will provide the foundations to understand the echo system, the tools and the methods utilized in high-performance computing (HPC) systems. The most competitive calculations and simulations are all currently being done in HPC systems. You will learn how to find your way inside a super-computer, and to query all the options available for your research such as memory, cores, nodes, job schedulers. The course will then move onto some programming languages structures, software engineering best practices, code optimization, performance metrics, and utilization of numerical libraries, which are essential to build real-world scientific and engineering applications. A good deal of time will be devoted to the paradigm of harnessing the power of several computer cores simultaneously in the context of practical applications in engineering and science. To this end the parallel computing models and implementations such as MPI, OpenMP, GP-GPU programming will be studied. By the end of the course, students will have a very solid understanding about current and emerging technologies for competitive career in computational engineering and sciences.
Prerequisites: None
Textbook: None; Lecture notes would be provided along with references.
Evaluation (tentative): Attendance: 5%, 9 homework assignments: 5% each (45% total),
1 Midterm: 25 % and a final exam: 25 % (last day of class)
Tentative Course Schedule:
- Introduction to Cluster computing: Linux, shell scripting, queuing systems, cluster architecture
- Scientific Computing using C++ and Fortran
- Scientific programming using Python
- Machine learning libraries
- Parallel programming with MPI and OpenMP
- Basics of GPGPU programming.

Copyright protection:
The course materials and online lecture videos posted on Blackboard/Moodle are only meant to be used within this course and should not be distributed.

The University of Houston Academic Honesty Policy applies:
http://www.uh.edu/provost/policies/honesty/

Students in need of counseling:
Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to the demands of a professional program, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the “Let’s Talk” program, a drop-in consultation service at convenient

Important Notes:
1. Our time together is very valuable; please treat it accordingly. If you arrive late, sit in the back and check so as not to disturb others when you arrive. By enrolling in this course you make a personal contract with me and your classmates to attend and diligently participate in every class activity. Students are expected to be courteous toward the instructor and their classmates throughout the duration of this course.
2. All cell phones and pagers must be “on silent” mode during classes and “turned off” during exams.
3. Attendance is taken at the beginning of the class.
4. Assignments must be submitted on the due date. No late or email submissions will be accepted. If ever accepted (Logical reason) a 20% penalty will be applied.
5. MAKE-UP EXAMS: There are no make-up exams.
6. 3-Day Policy: One has 3 days starting from the end of the class time in which the graded assignment/exam papers have been distributed and/or posted in order to object to the score of that assignment or exam. The objection shall be submitted electronically by emailing the TA and the instructor.
7. Academic Honor Code: As a student, you join a community of scholars who are committed to excellence in learning. I assume that students will pursue their studies with integrity and honesty. ZERO-TOLERANCE for CHEATING, whether in exams, quizzes or PROGRAMMING ASSIGNMENTS. Plagiarism, copying and other anti-intellectual behavior are prohibited by the university regulations. Violators will face serious consequences.

8. Student Conduct: Disruptive behavior inside or outside class may result in disciplinary actions and academic failure. Students must refrain from disturbing the peace and good order of the university. For more details, please refer to http://www.uh.edu/dos/pdf/codeofconduct.pdf

9. Academic Integrity: Cheating or any other suspected violations of academic integrity will not be tolerated and will be reported to the Department of Computer Science, Director of Undergraduate/Graduate Studies and if substantiated may result in significant penalty. It is each student’s responsibility to read and understand the Academic Honesty Policy found in the Student Handbook (http://www.uh.edu/academics/catalog/policies/academreg/academic-honesty/).

10. Plagiarism is using someone else’s work without proper acknowledgement. This includes getting help from a friend or colleague and online material. When using someone else's work, always cite the source. Plagiarism is considered a serious breach of academic integrity. ANY BREACH OF ACADEMIC INTEGRITY OR PLAGIARISM WOULD RESULT IN A MINIMUM OF ONE FULL LETTER GRADE REDUCTION OVER THE FINAL SCORE AND POSSIBLE EXPLUSSION FROM UNIVERSITY.

Email: Please use your blackboard email for any issue concerning your lab assignments, Homework. For any other issue you can contact Dr. Ebalunode at jebalunode@uh.edu