Parallel Programming
Course Introduction for those Taking it Online

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This course is being taught by:

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Mike has had over 30 years experience in the computer graphics and high performance computing worlds. He has taught over 100 university classes to a total of over 6,000 students. He has also taught over 80 professional short courses around the world.

In his spare time, he… oh, wait, there is none. Well, that’s not quite true. He does like to read. In the spare time within all of that, he dabbles in K-12 outreach, and, for his dog is very out-going. When I am on the computer at home, such as when holding WebEx Office Hours, she often comes into my office and just sits next to me as I am grading.

Callie
Callie is very shy. If you come to my house, she would hide under a bed. But, through WebEx, she won’t know you are there. You might see her, you might not.

What You Should Know on the Way In:
the Course Incoming Expectations

Above all, you should be a good C programmer. Being comfortable with function calls, arrays, for-loops, structures, arrays of structures, structures of arrays, pointers, and linked lists is a must. It is strongly suggested that you not use this class as an opportunity to learn C for the first time.

On the math side, you should know algebra. There will be times when we have an equation that solves for “Y given X” and I will ask, “What if we already know Y, can we then go back and find X?”.

What this Course Is
This course is all about parallel programming on the desktop for applications that you are attempting to accelerate to improve user interaction and simulation and computational performance.

The goals of this course are to leave you “career-ready” (i.e., both work-ready and research-ready) for tasks that require desktop parallelism, both on a CPU and a GPU. CS 475/575 topics include:

• Parallel computing: types, limitations
• Moore’s Law, Amdahl’s Law
• OpenMP
• Synchronization issues in parallel computing
• Cache issues in parallel computing
• SIMD
• GPU computing
• OpenCL
• Xeon Phi

What this Course Isn’t
This course is not about supercomputers or clusters. A lot of the same principles that we will discuss about the desktop do apply to supercomputers and clusters so this will still be useful.

However, if we have time, we will lightly touch on the Message Passing Interface, MPI, which is used in supercomputers and clusters.

Office Hours and Other Help
Sadly, I am a compulsive email checker. That is the best way to reach me. However, I am not necessarily a compulsive email-returner. I prioritize my email returns. Please do not email me over small things that you really can either look up or figure out for yourself (like “When is the assignment due?”). Those get low priority. The really serious concept questions get high priority.

I am a compulsive telephone ignorer. That is not a good way to reach me consistently. I do not like phone calls.

I will hold Office Hours over the Internet on WebEx. I have my own “room”. It’s URL is: https://oregonstate.webex.com/meet/mjboregonstate.edu

It’s only available when I am there to “open it up” (not unlike a real room). To use this, you will need a microphone and speakers. I recommend a headset. They pickup less background noise than a microphone does and it gives you better sound than a speaker does. I found a nice inexpensive one at Radio Shack.

I would love it if you also have a webcam, because then I can see you and get to know you better. And, because I often do these Office Hours from home, I sometimes get a little “help” from the following characters …
What We Will Be Covering

Note: this schedule is approximate!
I will try to keep the schedule on the class web site up-to-date.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
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Class Textbook

There is no textbook for this class. The course material will consist of handouts and notes taken while watching the videos.

If you need further reference material, there are a bunch of links at the end of the class web site. You’re not required to go look at any of these. They are just some links that I have found useful. They are there if you need them.

Canvas vs Web Pages

I would love to do this whole class in Canvas-only. There is a lot to be said for consistency of interface. But, Canvas has certain things it can’t do.

For example, you will use Teach (http://engr.oregonstate.edu/teach) to turn in your assignments. Because I can write scripts behind this system to extract parts of your submissions, I can grade them, and give you feedback a lot faster. Canvas will not let me do that.

So, we will use Canvas for a lot of things, but not all.