# CS 791: Topics: GPU Computing
## Spring 2018
Last Modified: 1/18/2018

**Instructor:** Dr. Frederick C Harris, Jr.
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Office hours: T,R: 11:00am-11:50am

Class webpage: https://www.cse.unr.edu/~fredh/class/791-GPU/791-S2018.php

**Instructor:** Dr. Lee Barford
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**Instructor:** Rui Wu
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**Lectures:**
T,R: 9:00am-10:15pm, PE 102

**Labs:**
none

## Important Notes and Dates:
- **Final Exam:** Tuesday May 12 12:30-2:30pm
- **Holidays:** M Mar 19 – F Mar 23 (Spring Break),

## Required Textbook:
- None

## Supplemental Books:
- *CUDA by Example: An Introduction to General-Purpose GPU Programming*, by Jason Sanders and Edward Kandrot, Addison Wesley, 2011
- *Programming Massively Parallel Processors: A Hands-on Approach*, by David B. Kirk and Wen-mei W. Hwu, Morgan Kaufman, an Imprint of Elsevier, 2010.

## Course Description:
### Catalog:
Special topics in computer science. May be repeated when course content differs.

## Prerequisites:
### Courses:
- CS 302 (Data Structures).

**Topics:**
- a good working knowledge of programming.
- a good working knowledge of threads or parallel programming.

## Course Objective:
Students will demonstrate an understanding of concepts, algorithms, and design principles underlying parallel programming on the GPU, develop algorithm design and implementation skills, and gain practical experience in programming with CUDA.

## Course Topics:
- Introduction to Parallel Programming
- Introduction to CUDA
- Paper Reviews
- Project

## Student Learning Outcomes:
- Upon completion of this course:
    1) Students will have an ability to apply engineering or computer science research and theory to advance the art, science and practice of the discipline
    2) Students will have an ability to design and conduct experiments as well as to analyze, interpret, apply and disseminate the data
    3) Students will have an understanding of research methodology

## Course Policies:
- Students are expected to attend, and be on time, for every class. This demonstrates professionalism and consideration for your fellow students and your Instructor. While the course does not have an attendance policy, students who miss class and/or are late for class may experience an impact on their grade by missing classroom discussions, activities, and/or quizzes
- Students are expected to turn in all assigned materials in a timely manner.
- Students are expected to demonstrate professionalism and courtesy by either silencing or turning off all cell phones and/or other alarm or audible indicator devices

- The Instructors reserve the right to add to, and/or modify any of the above policies as needed to maintain an appropriate and effective educational atmosphere in the classroom and the laboratory. In the case that this occurs, all students will be notified in advance of implementation of the new and/or modified policy.

### UNR Athletics:
- If you are involved with any ***university-sponsored*** athletic activities that will have an impact on your attendance, please provide your Instructor with a letter from your coach and/or the UNR Athletic Department as soon as possible, but no later than the end of the second week of classes. This should include the official schedule of your activities which will impact your attendance throughout the semester.

## Assignments, Examinations and Grading:

- All Formal Homework Assignments (Including exercises and Projects) and all Exams (Quizzes, Hour Exams, and the Final) are to be treated as individual and not collective efforts, **unless specified otherwise**. A severe penalty will be given to any assignment which indicates collusion or cheating. The usual penalty for cheating on project or an exam is failure in the course.

**Quizzes:**
- There will be several announced and unannounced quizzes in lecture.

**Programming Assignments:**
- The Programming assignments require the solutions to problems using the computer, in particular one with an NVIDIA CUDA capable video card. Typically, you will be asked to use a GitHub account to store your project code, with an appropriate write-up for your program.

**Late Submission Policy:**
- Projects will be collected at the start of the class session in which they are due. A programming assignment turned in after collection is done will be graded as late.
- The penalty for late assignments and projects will be as follows: $\max(10\%, n^2\%)$, where $n$ is the number of school days.

**Grading Structure:**
- The final grade will be based on (Tentative, subject to change):

| Section | 791 |
|---|---|
| Attendance/Participation | 10% |
| Programming Assignments | 30% |
| Project | 40% |
| Quizzes | 10% |
| Paper Presentation | 10% |

**Important Notes:**
- We will be using a +/- grading system.
- Every project must be completed, working, and turned in. For each project that is not, the final grade in the course may be lowered.

# Other Policies:

**Statement on Academic Dishonesty:**

- "Cheating, plagiarism or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include filing a final grade of "F"; reducing the student's final course grade one or two full grade points; awarding a failing mark on the coursework in question; or requiring the student to retake or resubmit the coursework. For more details, see the University of Nevada, Reno General Catalog." (copies of this policy are on-line at http://www.unr.edu/student-conduct/policies/university-policies-and-guidelines/academic-standards/policy). Your continued enrollment in this course implies that you have read it, and that you subscribe to the principles stated therein.

**Statement for Academic Success Services:**

- "Your student fees cover usage of the University Math Center (775) 784-4433, University Tutoring Center (775) 784-6801, and the University Writing Center (775) 784-6030. These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student."
- The University Math Center (UMC) is focused on helping students with mathematical and statistical concepts. While mathematics is used extensively in engineering, the UMC does not have the resources to help students with engineering courses. Engineering students are encouraged to use the UMC for help in their math classes, and they are welcome to use its computer lab and study area any time –regardless of course. However, UMC tutors cannot answer questions regarding engineering courses.

**Statement of Disability Services:**

- "Any student with a disability needing academic adjustments or accommodations is requested to speak with the Disability Resource Center (Pennington Student Achievement Center, Suite 230) as soon as possible to arrange for appropriate accommodations."

**Statement on Audio and Video Recording:**

- "Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may be given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded."

**Statement on Equal Opportunity and Title IX:**

- The University of Nevada, Reno is committed to providing a safe learning and work environment for all. If you believe you have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, or stalking, whether on or off campus, or need information related to immigration concerns, please contact the University's Equal Opportunity & Title IX office at 775-784-1547. Resources and interim measures are available to assist you. For more information, please visit: https://www.unr.edu/equal-opportunity-title-ix