Submit original with signatures + 1 copy + electronic copy to UAF Governance.
See http://www.uaf.edu/uafgov/faculty/cd for a complete description of the rules
governing curriculum & course changes.

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department	Electrical and Computer Eng.	College/School	CEM
Prepared by	Dejan Raskovic	Phone	474-5256
Email Contact	draskovic@alaska.edu	Faculty Contact	Dejan Raskovic

1. ACTION DESIRED (CHECK ONE):	Trial Course		New Course	**2**

2. COURSE IDENTIFICATION :	Dept	EE	Course #	643	No. of Credits	3

Justify upper/lower division status & number of credits :	Graduate course, no laboratory, meets two times a week for 1.5 hour

3. PROPOSED COURSE TITLE:	ADVANCED ARCHITECTURES FOR PARALLEL COMPUTING

4. To be CROSS LISTED? YES/NO   NO

The course covers massively parallel computer architectures and their application for computationally intensive engineering problems. Fundamental hardware concepts and issues in designing such systems are introduced. Compute Unified Device Architecture (CUDA), developed by NVIDIA for the compute engines in their graphic processing units (GPUs), will be used as an example and a practical platform for student assignments. Through assignments and a project students will learn how to employ extensive parallel processing capabilities of modern GPUs in C and Matlab programs for physical modeling, simulation, computational engineering, convolution, correlation, filtering, and similar problems of particular interest to engineering students. *Prerequisites: CS201 or ES201; EE443; graduate standing; or permission of the instructor.* (3+0)

				UAF library

20. IMPACTS ON PROGRAMS/DEPTS

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

Electrical and Computer Engineering, Computer Science

21. POSITIVE AND NEGATIVE IMPACTS

EE 643 – ADVANCED ARCHITECTURES FOR PARALLEL COMPUTING

COURSE INFORMATION

Instructor: Dr. Dejan Raskovic
Office: Duckering 225
Telephone: 474 r5256
Email: draskovic@alaska.edu
Web: go.alaska.edu/draskovic

Lectures: Monday, Wednesday, 17:30 – 19:00, Duckering 210
Office Hours: Monday 15:00 – 17:00, Thursday 11:30 – 12:30

COURSE DESCRIPTION

The course covers massively parallel computer architectures and their ap010.027m8Z3678Tm(OdR6B)T.

Attendance:

Students are strongly encouraged to attend every class and participate in the classroom discussion in a manner that would benefit other students as well.

Project:

A project topic for each student will be determined jointly by the student and the instructor, after discussing student's background and interests. A typical project assignment would be to design and implement a device for parallel computing (e.g., a multi rmicrocontroller system) or to solve an engineering or scientific problem using an existing parallel architecture.

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TENTATIVE COURSE TOPICS

WEEK	TOPIC
1	Review of main concepts
2	Sources of parallelism; Multiprocessors and thread level parallelism
3	GPGPU : Introduction
4	GPU architectures and PC host architectures
5,6	GPU Architecture Streaming processing arrays Streaming multiprocessors Device memory Interconnect
7	CUDA programming and memory models
8	CUDA API, tools, optimizations, arithmetic
9, 10	Multiprocessor and multicore interconnection networks; Models of parallel computers;
11	Routing; Bandwidth; Communication costs
12	Performance analysis of multiprocessor architectures
12	Multiprocessor SOC
13	Designing for low power
14	Project presentations

STUDENT SUPPORT SERVICES

CEM computer technicians are located in the Duckering building room 153 B   1   5   3   costs