

**THE UNIVERSITY OF NEW MEXICO
SENATE GRADUATE COMMITTEE**

DATE: November 17, 2006

TO: SGC Committee

FROM: SGC Curriculum Sub-Committee (Grant Meyer, Chair; Ann Cunliffe, Mary Ellen Hanson)

RE: Curriculum Forms – New Degree Proposals, Degree Program Changes and New Course Requests

College/School	Graduate Unit	Form	Course Title & Description/Justification/Reason	Action
Engineering	Computer Science	B	CS 510: Randomized Algorithms (3). Introduction to probability theory, moments and deviation, tail inequalities, probabilistic method, Markov Chains and Random Walks, dynamic graph algorithms, data stream algorithms, and parallel and distributed algorithms. No duplication, elective, offered once as topics course with enrollment of 22.	APPROVE
Engoneering	Computer Science	B	CS 511: Algorithms in the Real World (3). Study of algorithms which have been successful in real world. New algorithmic tools, ways to create approximation algorithms for NP-Hand problems, exploit the power of randomness, and create tractable abstract problems form messy real-world problems. No duplication, elective, offered once as topic course with enrollment of 6. Graduate students will be expected to have some basic knowledge of this area. They will also be expected to conduct independent research and apply classroom material to their research.	APPROVE
Engineering	Computer Science	B	CS 429/529: Introduction to Machine Learning (3). Introduction to principles and practice of systems that improve performance through experience. Topics include statistical learning framework, supervised and unsupervised learning, Bayesian analysis, time series analysis, reinforcement learning, performance evaluation and empirical methodology; design tradeoffs. No duplication, elective, offered once as topics course with enrollment of 11. Graduate students will be asked to go above and beyond the syllabus by developing a small independent research project.	APPROVE

			This project encapsulates the entire research process in microcosm: problem formulation, background reading, proposal, incorporation of feedback, data gathering, design and development, empirical and/or mathematical validation, oral reporting, and formal written report. The project serves both as an extension to class material and as an introduction to the research process.	
Engineering	Computer Science	B	CS 561: Algorithms/Data Structure (3). Study of data structure and algorithms and mathematics needed to analyze their time and space complexity. Topics include: amortized analysis and self-adjusting data structures for trees and priority queues, graphing algorithms, greedy and divide-and-conquer paradigms. No duplication, elective, offered once as topics course with enrollment of 47.	APPROVE
Engineering	Computer Science	B	CS 569: Computational Medicine (3). Goal of course is promote analytical thinking through introduction of new application domains. Topics: theory of graph algorithms, convex programming, applied optimization techniques, application of radiological physics, basic radiobiology, radiation therapy planning, and medical imaging. No duplication, elective, offered as topics course once with enrollment of 11.	APPROVE
Engineering	Computer Science	B	CS 571: Introduction to Quantum Computation (3). This course explores the fascinating power of quantum computing, including entanglement, teleportation, cryptography, and Shor's factoring algorithm. No duplication, elective, offered as topics course once with enrollment of 8.	APPROVE
Engineering	Computer Science	B	CS 473/573: Physics and Computation (3). A survey of complex systems at the interface between physics and computer science, including phase transition, power laws, social networks, NP-completeness, and Monte Carlo methods. No duplication, elective, has not been previously taught as topics course. Graduate students will be expected to have some basic knowledge of this area. They will also be expected to conduct independent research and apply classroom material to their research	APPROVE
Engineering	Computer Science	B	CS 581: Fundamentals of Software Testing (3). Introduces the components of software development life cycle and role of software test process, test planning and strategy, static testing, tracking bugs, dynamic testing, use of automated testing tools as well as other testing concepts. No duplication, elective, offered once as topics course with enrollment of 14.	APPROVE
Engineering	Computer Science	B	CS 583: Object-Oriented Testing (3). Introduction to software test process. Topics include: testing perspectives, object-oriented concepts, UML diagrams, development/testing processes, test design, test case automation, test patterns, and understanding basic concepts of class hierarchies. No duplication, elective, offered as topics course once with enrollment of 27	APPROVE