Ph.D. in Computational Analysis and Modeling

Degree Codes: ES PhD CAM   **Contact:** Professor Weizhong Dai

Ph.D. Curriculum

Course Category	Number	Course Name		SCH
Math Core	MATH 414	Numerical Analysis	3	9 or 12
	MATH 415	Numerical Analysis	3	
	Pick one of the following options or approved Math graduate course			
	MATH 407[1]	Partial Differential Equations	3	
	STAT 620 and 621[2]	Theory of Probability / Theory of Statistics	6	
CSC Core	Pick two of the following courses or approved CS graduate course[3]			6
	CSC 520	Advanced Analytical Algorithms and Complexity	3	
	CSC 521	Advanced Computer Architecture	3	
	CSC 532	Advanced Topics: Software Engineering	3	
Qualifying Examinations	CAM 685	Mathematics Written Qualifying Exam (winter or spring)	0	
	CAM 686	Computer Science Written Qualifying Exam (winter or spring)	0	
	CAM 687	Oral Comprehensive Exam[4]	0	
Doctoral Seminar	CAM 611	Doctoral Seminar (taken three times in fall quarters)	1	3
Research and Dissertation[5]	CAM 651	Pre-Candidacy Doctoral Research	1-9	9
	CAM 751	Post-Candidacy Dissertation Research	1-9	9
Supporting Core	Chosen from one of the suggested five tracks below or another can be developed.[6]			9 or 6
Electives	See suggested electives below for each of the tracks.			27
				Total 72

[1] If the student takes MATH 407, then they must take **two** additional approved Math courses from their chosen track.

[2] If the student takes STAT 620 and 621, then they must take **one** additional approved Math course from their chosen track.

[3] For students with non-CS backgrounds, CSC 220 and/or CSC 430 should be taken before these courses are attempted.

[4] The oral exam includes a lecture followed by a question/answer period on the student's proposed dissertation topic that exhibits a clear demonstration of an understanding of the principles and methods involved in his/her proposed area of specialization. A written proposal, uploaded in a student's plan of study and approved by their committee, is required before a student may enroll in CAM 687.

[5] Complete 9 SCH of CAM 651 prior to CAM 687. After successful passing CAM 687, complete 9 SCH of CAM 751. Registration in any quarter is for 1 to 3 semester hours or multiples thereof, up to a maximum of 9 semester hours per quarter.

[6] In addition to the suggested tracks, similar tracks can be developed for engineering, physics, and operations research in consultation with Advisory Committee.

*Students are expected to have published one or more peer reviewed journal publications or conference proceedings by the time they graduate.

Suggested Tracks	A	B	C	D	E
	High Performance Computing, High Availability Computing	**Data Mining, Bioinformatics, Data Warehousing**	**Cyberspace, Network Science, Information Assurance**	**Computation, Simulation, Modeling**	**Applied Statistics, Knowledge Discovery**
Supporting Core CS – 3 SCH MATH – 3 or 6 SCH[1,2]	CSC 585 MATH 435 MATH 585 or 535	CSC 579 STAT 652 or STAT/QA 625 MATH 435	CSC 475 MATH 435 MATH 535	CSC 557 MATH 574 MATH 575	CSC 579 STAT 507 STAT 506 or QA 625
Suggested Electives for each track (or those approved by adviser) 27 SCH Total	CSC 581	CSC 580	CSC 450	CSC 585	STAT 507 or QA 630
	CSC 582	CSC 557	CSC 554	MATH 435	STAT 625 or QA 635
	CSC 534	STAT 506 or QA 635	CSC 575	MATH 535	STAT 651
	CSC 557	STAT 652	CIS 521	STAT 620	STAT 652
	STAT 620	MATH 574	CIS 522	STAT 625	STAT 650
	STAT 625	MATH 575	CIS 523	STAT 651	STAT 680
	STAT 506	MATH 535	CIS 524	CSC 470	MATH 574
	QA 625	CAM 657	CAM 657	CSC 570	MATH 575
	MATH 575	CAM 650	CAM 650	CSC 579	MATH 435
	CAM 657			CAM 657	MATH 535
	CAM 650			CAM 650	CAM 657
					CAM 650
	At least 9 SCH needs to be of a third area, called the area of application, chosen different from MATH and CSC courses				

Plan of Study Important Information: When entering information in the plan of study, it is important to note that only core courses and all core courses need to be put in section 1.1, while all others are put in section 1.2 (i.e. special topics, seminar, and research courses). See
http://coes.latech.edu/grad-programs/plan-of-study-instructions.pdf for plan of study instructions.

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