Ph.D. in Computational Science

The University of Texas at El Paso offers studies leading to degrees of Doctor of Philosophy (PhD) and Master of Science (MS) in Computational Science (CPS). This is an interdisciplinary program that combines computer science, mathematics, and other science and engineering disciplines across different departments in the Colleges of Science, Engineering, and Health Sciences, yielding an integrated knowledge base for the effective solution of complex systems in which computer usage plays a fundamental role. A CPS student is expected to acquire an integrated understanding of techniques such as mathematical modeling, algorithmic design, computer simulation, scientific visualization, statistical processing of large datasets, and high-performance computing on parallel and distributed systems.

Admission Requirements

1. Bachelors or master's degree in any field of mathematics, science, or engineering from an accredited institution in the United States, or proof of equivalent education in a foreign institution;
2. Demonstration of academic achievement and potential as indicated by the results of the Graduate Record Examination (GRE) and upper-level undergraduate and/or graduate coursework;
3. Applicants whose degrees are from non-English speaking institutions are required to demonstrate English proficiency. Please consult the Graduate School (https://www.utep.edu/graduate/future-students/applicant-timelines.html) website for required scores;
4. A statement of academic and professional interests and goals from the applicant; and
5. Three letters of recommendation from people knowledgeable of the field.

Prospective students who have insufficient skills in mathematics, natural sciences, computers, and programming should contact the Program Director to discuss procedures leading to acceptance into the program. Students who will not be fully prepared for the PhD program can be admitted to the M.S. program.

A CPS student is expected to maintain an overall cumulative grade point average of 3.0 or better, and to complete the program, must take at least six (6) hours in each of the following areas: Computer Science, Mathematics, and Science/Engineering classes.

Degree Requirements

Every CPS PhD student is required to take a two-part qualifying exam, which should be taken as soon as the student has completed the four core courses MATH 5329, CPS 5401, CPS 5310, and CPS 5320. The first part tests the student's understanding of fundamental concepts in computational science, and the second part tests the student's computational skills. A doctoral student failing either or both parts of the qualifying exam will be required to do one of the following:

1. Withdraw from the program;

2. Retake part(s) of the qualifying exam when it is offered the next time; or

3. Opt for continuing with an academic or professional master's degree.

Only one retake of any part of the qualifying exam is permitted. Students are expected to fully pass the qualifying exam by the end of two years in the program. A student qualifying to continue working towards the PhD will choose a dissertation topic and advisor(s) from the CPS faculty. The current CPS faculty list (https://www.utep.edu/science/computational-science/people/faculty-and-staff.html) and their research areas can be found at the program website (https://www.utep.edu/science/computational-science/people/faculty-and-staff.html).

Degree Plan

Required Credits: 70

Code	Title	Hours
PhD in Computational Science (All courses require a grade of C or better)		
Core Courses:		
CPS 6310	Mathematical & Comp. Modeling	3
CPS 6320	Advanced Scientific Computing	3
CPS 6401	Introduction to Comp Science	4
MATH 6329	Numerical Analysis	3
Prescribed Electives:		
Select two courses from the following:		6
CS 6334	Parallel & Concurrent Program	
CS 6350	Advanced Algorithms	
MATH 6330	Comp Methods of Linear Algebra	

MATH 6343	Numer Solution Part Diff Equat	
MATH 6345	Topics in Optimization	
STAT 6329	Statistical Programming	
STAT 6385	Statistics in Research	
Free Electives:		
Select twenty-one credits of graduate level courses offered in the Colleges of Science and Engineering		21
Research:		
Complete eight research courses		24
CPS 6386	Graduate Interdisciplinary Res (Complete 2 semesters)	
CPS 6387	Graduate Research (Complete 2 semesters)	
CPS 6396	Graduate Research (Complete 2 semesters)	
CPS 6397	Doctoral Project (Complete 2 semesters)	
Dissertation:		
CPS 6398	Dissertation	6
& CPS 6399	and Dissertation	
Total Hours		**70**

PROGRAM DIRECTOR: Ming-Ying Leung (http://facultyprofile.utep.edu/default.aspx?ID=mleung)

Professors

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