

# Doctor of Professional Studies in Computing



**The Doctor of Professional Studies (DPS) in computing provides information technology (IT) professionals a unique opportunity** to pursue a part-time doctoral degree while continuing to work full time. It supports interdisciplinary study among the computing disciplines as well as applied research in one or more of them, providing the background highly valued by industry. It is an innovative post-master's doctoral program that is structured to meet the needs of the practicing IT professional.

The DPS in computing, while advanced in content and rigorous in its demands, can be distinguished from the Doctor of Philosophy (PhD) in that its focus is the advancement of the practice of computing through applied research and development. The Doctor of Professional Studies is a professional doctorate that integrates computing and professional cultures. It is considered by the National Science Foundation to be a research doctorate equivalent to the PhD.

## **An Innovative Learning Community**

The DPS program provides an intellectually stimulating learning environment in which cutting-edge and emerging computing and information technology can be discussed and researched in an open-forum style. Students and faculty are encouraged to share their experiences and ideas with everyone in the program. Each fall a class of 20 students is admitted who bring professional expertise in specialized areas of computing to the learning community. The class proceeds through the program as a cohort, and is expected to graduate together after three years.

The long duration of traditional doctoral programs often stems from the difficulty of completing dissertation research in a timely manner. Unlike other programs, Pace DPS students focus on research beginning in the first semester of study, under the guidance of faculty advisers. As students progress through the program's seminars, readings, and discussions, they are exposed to emerging issues in computing and information technology. In many cases, these research seminars help lay a direct foundation for a dissertation or indirectly stimulate interest in an area that ultimately leads to a dissertation. The program has built-in coaching and mentoring by faculty advisers and, most importantly, by the students themselves.

## **A Professionally Diverse Student Body**

There is a great deal of professional diversity among Pace's DPS students. Entering students' careers extend from 6 to 33 years, with an average of about 13 years. Professional activities include software development, telecommunications management, data

management, and e-commerce, with employers such as Verizon, IBM, SIAC, Avon Products, ITT Industries, Computer Associates, MetLife, New York Life, JPMorgan Chase, Philips Research, AT&T, Brookhaven National Labs, E\*Trade, Oracle, Pfizer, Sothebys.com, and PricewaterhouseCoopers. Many of our DPS students live and work in the greater New York metropolitan area, but others travel from California, Washington, D.C., Philadelphia, and Boston for the on-site sessions that occur monthly, five times a semester, on Friday evening and all day Saturday. In between the on-site sessions, students and faculty interact energetically over the Internet.

## **Curriculum Structure**

The DPS in computing is a 48-credit program, which assumes the prior completion of a master's degree in computing or a closely related discipline. Research commences in the first year when students begin an 18-credit integrative core and a 6-credit research seminar sequence, and continues through the 12-credit advanced elective sequence in the second year. A 12-credit dissertation completes the 3-year program.

## **First Year of Study**

### **Software Design and Implementation**

DCS 801, 802, 803

Fall, Spring, Summer; 6 credits total

### **Software Systems Development and Engineering**

DCS 821, 822, 823

Fall, Spring, Summer; 6 credits total

These courses address the environment in which software systems are built and used. Critical and emerging issues in computer science, information systems, and software engineering, and their relationship to software development and design provide the major theme. This includes Internet computing and component technologies, and the development of significant Web-based e-commerce applications with Enterprise JavaBeans.

Students develop projects working in small teams. The project development explores cutting-edge agile object-oriented development methodologies such as extreme programming (XP), open source and mob software, and is implemented in Java. Pattern-oriented software architecture as an approach to software development is explored. Emphasis is on practice oriented software engineering and information systems, tool rich working environments, team development efforts, cost performance trade-offs in business contexts, and tasks other than source-code development.

**Topics include:** Problem solving paradigms; the software engineering problems of scale, cost, schedule, quality, and consistency; software development process; requirements; object-oriented analysis and design; organizational patterns; analysis patterns, design patterns; object-oriented architectures; process improvement—CMM, ISO 9001; human computer interface design issues; Internet programming; computer ethics.

**Data Communications, Networking, and Internet**  
DCS 833, 834, 835

Fall, Spring, Summer; 6 credits total

These courses progress from the basics of data, signals, and information transmission to principles of computer networking and the operation of current and evolving Internet protocols, providing a foundation for planning and management of network facilities and design and implementation of Internet based applications. The ISO Reference Model and the TCP/IP protocols form the framework for introducing Internet facilities, services, protocols, and applications. Students investigate new network technologies and applications in small team projects.

**Topics include:** Models of communications and layered architectures; analysis of data, signals, and transmission capacity; digital voice and video; link protocols and error control; multiplexing and statistical sharing of network resources; probability models of network traffic; LAN strategies and standards such as shared and switched Ethernet, FDDI and ATM; LAN internetworking using bridges and routers; routing strategies and congestion in networks; the IP protocol; transport layer strategies and the TCP and UDP protocols; HTTP and the Web; Domain Name System, FTP, and SNMP; security and e-commerce; multicasting, multimedia, quality of service.

**Research Seminar**  
DCS 891A, B, C, D, E, F

Fall, Spring, Summer; 1 credit each

Students are introduced to a variety of methods and styles of computing research through presentations by faculty and industry professionals and by studying selected research documents. Students learn to identify new computing research problems and to formulate research proposals in preparation for dissertation research.

DCS 891A, B, C are taken in the first year of study  
DCS 891D, E, F are taken in the second year

## Second Year of Study

**Topics in Computing and Information Technology**  
DCS 860, 861

Fall, Spring; 2 or 3 credits (6 credits per semester)

These courses consist of topics of current interest to students. Cutting-edge issues and emerging information technology areas are explored. Students register for two or three topics per semester. A major goal for these courses is to understand the technological life cycle of emerging information technologies, their issues and potential impact. Visiting experts in computing and IT discuss their current research and development activities.

**Topics include:** Small computing devices—pen computing and hand-writing recognition, speech recognition techniques and applications; data security; Internet performance and high-volume Web serving technologies; data mining; e-commerce issues; pervasive computing, XML technologies and Web

services; VoiceXML, natural language processing; software patterns; distributed components and middleware; user interface development environments and tools; artificial intelligence and genetic algorithms; virtual reality

## Third Year of Study

**Dissertation for DPS in Computing**  
DCS 990, 991

Fall, Spring; 6 credits each

The dissertation is an original, rigorous, independent applied research product that may advance knowledge, improve professional practice, and/or contribute to the understanding of computing. The dissertation must be of sufficient strength to be able to distill from it a paper worthy of publication in a refereed journal or conference proceeding. Although publication is not a requirement for completing the doctoral degree, students are required to prepare a paper to submit for publication.

Examples of dissertation areas include: Data warehousing, patterns and pattern languages, visualization of data, genetic algorithms, distributed systems architecture, software component integration, Web site personalization and privacy, software testing and quality assurance, data security, Web content management strategies, Web services for businesses, broadband wireless network access services, biometrics, and pattern recognition

## Calendar of Class Meetings and Activities

Fall 2006–Spring 2009

<b>Fall 2006</b>	<b>Spring 2007</b>	<b>Summer 2007</b>
August 11–12*	January 19–20	June 1–2
September 6–9	February 16–17	June 22–23
October 6–7	March 16–17	July 13–14
October 27–28	April 13–14	August 10–11
November 17–18	May 4–5	
December 15–16		

\*Optional OO/Agile/Java Workshop

<b>Fall 2007</b>	<b>Spring 2008</b>	<b>Summer 2008</b>
September 7–8	January 25–26	July 12
October 5–6	February 22–23	
October 26–27	March 14–15	
November 16–17	April 11–12	
December 14–15	May 2–3	

<b>Fall 2008</b>	<b>Spring 2009</b>
October 11	February 7
November 8	March 7
December 6	April 25

All meetings take place at the Pace University Graduate Center, One Martine Avenue, White Plains, New York. With the exception of the OO/Agile/Java workshop and the four day first week, the meeting times are Friday, 5:00–9:00 p.m., and Saturday, 8:30 a.m.–5:30 p.m.

## Tuition and Payment Schedule

Class of 2009 (Entering Fall 2006)

<b>Total Tuition*</b>	<b>Payment Schedule</b>	
Year 1 \$19,900	Upon acceptance	\$200
Year 2 19,900	Fall 2005	9,750
Year 3 19,900	Spring 2006**	9,950
	Fall 2006	9,950
	Spring 2007**	9,950
	Fall 2007	9,950
	Spring 2008	9,950
\$59,700		\$ 59,700

\* Proposed tuition schedule includes total cost of program except for travel and lodging

\*\* Includes summer tuition

For additional information visit our Web site at <http://csis.pace.edu/dps>.

Email your inquiry to [csisdps@pace.edu](mailto:csisdps@pace.edu), or call (914) 422-4447