

Computer Science Department

**Chairperson**

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**Graduate Program Administrator for M.S. and Ph.D. Programs in Computer Science**

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**Graduate Program Director for M.S. Program in Information Systems Engineering (MSIS)**

Robert F. Kelly, 2427 Computer Science, (631) 632-7543

**Staff Assistant for MSIS**

Marion Mastauskas, 127 Engineering Building, (631) 632-8760

**Degrees Awarded**

M.S. in Computer Science; M.S. in Information Systems Engineering; Ph.D. in Computer Science

**Web Site**

<http://www.cs.stonybrook.edu/>

**Computer Science**

The Department of Computer Science offers an M.S. and a Ph.D. in Computer Science, and an M.S. in Information Systems Engineering.

The M.S. program in Computer Science is designed primarily to train students with professional goals in business, industry, or government, requiring a detailed knowledge of computer science concepts and applications. The program concentrates primarily on applied computer science, emphasizing software development, programming, computer systems, and applications. Each student is given the experience of working on a large-scale software or hardware development project involving analysis, design, evaluation, and implementation.

The Ph.D. program in Computer Science is for students interested in obtaining academic or research positions in colleges and universities or in government or commercial research laboratories. The program gives students a rigorous and thorough knowledge of a broad range of theoretical and practical research subject areas and develops the ability to recognize and pursue significant research in computer science. The first two years of graduate study are devoted to coursework. By the end of the second year the research phase of the student's graduate career should be underway, with participation in advanced study and preliminary research work. The final years of graduate study are devoted to dissertation research.

The primary areas of departmental research interests include, among others, computation theory, logic, algorithms, concurrency, databases, languages, artificial intelligence, image processing, graphics, operating systems, networking, and architecture.

Information in this Bulletin concerning the M.S. and the Ph.D. programs in Computer Science is an abbreviated version of the Graduate Program Handbook found at [www.cs.sunysb.edu/graduate/GraduateHandbook.html](http://www.cs.sunysb.edu/graduate/GraduateHandbook.html). Students must refer to the Handbook for further details and the up-to-date information. Additional information about the graduate program in Computer Science can be found on the department's Web site at [www.cs.sunysb.edu](http://www.cs.sunysb.edu).

The program for Masters of Science in Information Systems Engineering (MSIS) emphasizes the engineering and application aspects of Information Technology (IT). The program differs from a traditional Information Systems program in that it focuses on an engineering approach to IT. The curriculum of the program also emphasizes individual communications skills and team participation.

The MSIS degree program has distinct specialization tracks geared to different classes of IT employment. The curriculum, consisting of 30 credits of coursework, is designed to accommodate students from a wide variety of backgrounds. An Executive track, specially designed for full time employees with working experience, facilitates the 30 credits to be completed with an evening/weekend schedule. Specialization tracks for the program include Systems Engineering, Telecommunications, and Software Engineering. The core component of the program consists of courses in programming; hardware; data management; analysis, modeling, and design; data communications and networking; and technology integration. Following the completion of the core requirements, students can specialize in one of the tracks by choosing appropriate electives. Students are expected to solve real world problems by applying and integrating newly acquired skills. The integration requirement can be satisfied at any time after the completion of the core courses.

**Admission to the M.S. in Information Systems Engineering**

Admission to the regular program is based on the following criteria:

- A. A baccalaureate degree from an accredited applied science or engineering program with a minimum GPA of 2.75. (Provisional admissions may be granted in exceptional cases if the GPA is less than 2.75 but above 2.25 provided it is approved by the Graduate School at the recommendation from the IS Graduate Committee. Provisionally admitted students are required to take at least two courses in the first semester and receive a B average to continue in the program.)
- B. GRE scores (Provisionally admitted students without GRE scores must take the examination within the first semester of their registration.)
- C. A minimum score of 550 in TOEFL for applicants whose first or native language is not English.

D. Letters of recommendation, and

E. Other documents as described in the Graduate Bulletin.

Admission to the Executive track is based on the following criteria:

A. A baccalaureate degree from an accredited applied science or engineering program, with a minimum GPA of 2.75.

B. IT related work experience,

C. Details of work experience, responsibilities/duties, and career goals, and

D. A minimum score of 550 in TOEFL if the baccalaureate degree is from a foreign institution, and

E. Letters of recommendation from current and previous employers and teachers.

For admission to the MS in Information Systems Engineering program, all applicants are required to submit completed applications to the Graduate School through the College of Engineering and Sciences, with the following documents: (1) an official graduate application form specially designed for applicants to the proposed program with non-refundable application fee as prescribed by the University, (2) three letters of recommendation, (3) two official copies of all previous transcripts (if in a foreign language, English translation is required together with the originals), (4) details of the employment history and duties/responsibilities, (5) scores of GRE, (f) scores of TOEFL in case of applicants for whom English is not the first language, and (6) a personal statement describing the previous accomplishments, career objectives and future goals. Students in the Executive track may be waived of GRE requirements with the approval of Graduate School.

All applications submitted in time are reviewed by the Graduate Committee and applicants who meet the requirements are selected on a competitive basis. Applications are scored on a scale reflecting academic achievements, GRE scores, work experience, and career goals. Preference is given to the applicants with relevant experience. Special considerations are made for women, minorities and physically challenged applicants provided they meet the minimum admission criteria. Preference also is given first to the New York residents and second to the U.S. citizens and permanent residents.

Applicants for the Executive Track are considered in a separate pool. Their applications must contain a support letter from the employer describing the length of service in the company, the responsibilities and authority, evaluation of the job performance, and how the participation in the Executive track by the applicant benefits the company.

Students of high caliber seeking to enter the program with an incomplete set of undergraduate courses or not having enough prerequisites are required to complete a predetermined number of foundation courses (normally consisting of nine credits), including Information Systems and business:

Fundamentals of Information Systems

Information Technology Hardware and Software

Programming, Data, and Object Structures

Facilities of Computer Science Department

The Computer Science Department is composed of a number of special interest labs (Visualization, Experimental Systems, Logic Modeling, Security Systems, File systems, Human Interface with Computers, Wireless Networking and Multimedia) connected by a multi-gigabyte backbone. Typical systems are PCs running FreeBSD, Linux, MS Windows, and Sun Sparc systems. There are numerous multiprocessor/large memory systems including a graphics cluster of Linux and MS Windows PC's. General access labs provide Unix and MS Windows systems, and each office desktop is equipped with a workstation. The department maintains its own dial-up service and wireless network. The Stony Brook campus is connected to the Internet via multiple OC3 connections.

Requirements for the M.S. Degree in Information Systems Engineering

To receive the MS in Information Systems Engineering degree the student must obtain a minimum of 3.0 overall GPA in the courses taken to satisfy the requirements of this program. In addition, the student must satisfy all other requirements of the Graduate School not mentioned here. Following are the specific requirements that must be met to obtain the degree:

Each student must complete a minimum of 30 credits of graduate course work, consistent with program guidelines.

Each student must complete 15 credits of core courses (Systems Engineering Principles, Quantitative Computer Architecture, Data Management, Analysis, Modeling, and Design, Data Communications and Networking).

A three-credit course covering an integration topic is required for all students (e.g., ISE 511, CSE 580, or CSE 523).

The required courses total eighteen credits, including the fifteen credits of core courses and three credits of integration. A minimum of twelve credits of electives is required of all students, out of which nine credits must be taken in the area of specialization. In case of core courses waived for equivalent courses taken previously, the student must earn those credits through electives at the University at Stony Brook, bringing the total credits to a minimum of 30.

A maximum of six credits of graduate course work can be transferred for the courses taken elsewhere provided these credits were not used by the previous institution to award a degree.

Each student is assigned an academic advisor who must approve the coursework, area of specialization and sequence of courses.

*Curriculum for the Executive Track:* The executive track is designed primarily for the employees of one company (or a group of companies). This requirement is identical to the requirement of the standard program. The curriculum is common to all the students in the program and targeted to the interests of the sponsoring company (or companies).

### **Courses for the M.S. Degree in Information Systems Engineering**

#### *Information Systems Engineering (ESE)*

ISE 503 Data Management

ISE 504 Analysis, Modeling and Design

ISE 506 Quantitative Computer Architecture

ISE 516 Systems Engineering Principles

ISE 517 Human Factors in Systems Engineering

#### *Applied Mathematics & Statistics (AMS)*

A complete description of AMS courses below can be found at [www.grad.sunysb.edu/academics/bulletin/Ams.pdf](http://www.grad.sunysb.edu/academics/bulletin/Ams.pdf).

AMS 507 Introduction to Probability

AMS 550 Operations Research: Stochastic Models

AMS 553 Simulation and Modeling

#### *Biomedical Engineering (BME)*

A complete description of BME courses below can be found at [www.bme.sunysb.edu/bme/grad/courses.html](http://www.bme.sunysb.edu/bme/grad/courses.html).

BME 526 Biological Systems Engineering

#### *Technology and Society (EMP and EST)*

A complete description of EMP courses below can be found at [www.sunysb.edu/est/courses/graduate.html](http://www.sunysb.edu/est/courses/graduate.html).

EMP 518 Project Management

EST 530 Internet Electronic Commerce

EST 582 Systems Approach to Human-Machine Systems

#### *Electrical and Computer Engineering (ESE)*

A complete description of ESE courses below can be found at [www.ee.sunysb.edu/~www/grad/coursedescriptions\\_b.html](http://www.ee.sunysb.edu/~www/grad/coursedescriptions_b.html)

ESE 504 Performance and Evaluation of Communication and Computer Systems

ESE 505 Traffic Performance Analysis of Mobile, Wireless, and Personal Communication Systems

ESE 528 Communication Systems

ESE 546 Computer Communication Networks I

ESE 547 Digital Signal Processing

ESE 548 Computer Communication Networks II

#### *Business Technology Management*

A complete description of BTM courses below can be found at [www.grad.sunysb.edu/academics/bulletin/Bus.pdf](http://www.grad.sunysb.edu/academics/bulletin/Bus.pdf)

BTM 514 Quality Management and Quality Assurance

#### *Computer Science (CSE)*

A complete description of CSE courses below can be found at [www.cs.sunysb.edu/graduate/courses/](http://www.cs.sunysb.edu/graduate/courses/).

CSE 500 Patterns in Programming

CSE 506 Operating Systems

CSE 515 Introduction to Transaction Processing Systems

CSE 523 Introduction to Software Engineering and Project Planning I

CSE 524 Introduction to Software Engineering and Project Planning II

CSE 533 Computer Network Communications Protocols

CSE 536 Introduction to User-Interface Development

Faculty of Computer Science Department

Professors

Bachmair, Leo, Ph.D., 1987, University of Illinois, Urbana-Champaign: Computational logic; automated deduction..

Chiueh, Tzi-cker, Ph.D., 1992, University of California, Berkeley: Processor architecture; parallel I/O; high-speed networks; compression.

Kaufman, Arie, Chairperson. Ph.D., 1977, Ben-Gurion University: Computer graphics; visualization; user interfaces; computer architecture; virtual reality; multimedia.

Kifer, Michael, Graduate Program Director. Ph.D., 1984, Hebrew University of Jerusalem: Database systems; logic programming; knowledge representation; Web information systems, workflow management systems.

Ko, Ker-I, Ph.D., 1979, Ohio State University: Computational complexity; theory of computation; computational learning theory.

Liang, Jerome, Ph.D., 1987, The City University of New York: Medical imaging; image processing.

Mitchell, Joseph, Ph.D., 1986, Stanford University: Operations research; computational geometry; combinatorial optimization.

Qin, Hong, Ph.D., 1995, University of Toronto, Canada: Computer graphics; geometric and physics-based modeling; computer aided design; computer animation and simulation; scientific computing and visualization; virtual environments; computational vision; medical imaging; human-computer interaction; robotics.

Ramakrishnan, I.V., Graduate Program Advisor, Ph.D., 1983, University of Texas, Austin: Automated reasoning; technologies for web-based computing.

Sekar, R.C., Ph.D., 1991, University at Stony Brook: Computer security; distributed systems; programming languages/software engineering.

Skiena, Steven, Ph.D., 1988, University of Illinois, Urbana-Champaign: Computational biology; combinatorial algorithms; combinatorial computing environments; data structures..

Smolka, Scott A., Ph.D., 1984, Brown University: Computer-aided verification of safety-critical systems; computer system security.

Stark, Eugene, Ph.D., 1984, Massachusetts Institute of Technology: Programming language semantics; theory of concurrency; formal methods; operating systems.

Warren, David S., Ph.D., 1979, University of Michigan: Logic programming; database systems; knowledge representation; natural language and logic.

Wittie, Larry D., Ph.D., 1973, University of Wisconsin: Computer Architecture; massively parallel computation; simulation of memory and attention in mammal brains.

Yang, Yuanyuan, Ph.D., 1992, Johns Hopkins University: Parallel and distributed computing systems; high speed networks; multicast communication; optical networks; high performance computer architecture; computer algorithms; fault tolerant computing.

Associate Professors

Arkin, Esther, Ph.D., 1986, Stanford University: Combinatorial optimization; network flows; computational geometry.

Badr, Hussein G., Ph.D., 1981, Pennsylvania State University: Computer communication networks and protocols; performance evaluation; modeling and analysis.

Brennan, Susan, Ph.D., 1990, Stanford University: Cognitive psychology; linguistics; human-computer interaction.

Bender, Michael, Ph.D., 1998, Harvard University: Algorithms; scheduling; data structures; cache and I/O-efficient computing; parallel computing.

Das, Samir, Ph.D., 1994, Georgia Institute of Technology: Mobile/wireless networking; ad hoc and sensor networks; parallel discrete-event simulation; performance evaluation.

Grosu, Radu, Ph.D., 1994, Technical University of Munich, Germany: Model-based design and verification of embedded software systems; model checking; abstract interpretation; logic and automata theory; type theory; computational models in systems biology; applied formal methods; software and systems engineering.

Liu, Yanhong Annie, Ph.D., 1996, Cornell University: Programming languages; compilers; software systems.

Mueller, Klaus, Ph.D., 1998, Ohio State University: Computer graphics; visualization; projector-based graphics; augmented reality; virtual reality; medical imaging face recognition; GPU-acceleration of general purpose computing; visual data mining; functional brain analysis.

Ramakrishnan, C.R., Ph.D., 1995, University at Stony Brook: Formal verification of concurrent systems; logic programming; computer security.

Samaras, Dimitris, Ph.D., 2000, University of Pennsylvania: computer vision; computer graphics; medical imaging; animation and simulation; image-based rendering; physics-based modeling.

Stoller, Scott, Ph.D., 1997, Cornell University: Distributed systems; software testing and verification; program analysis and optimization.

Wasilewska, Anita, Ph.D., 1975, Warsaw University: Logic; knowledge representation; artificial intelligence.

Zadok, Erez, Ph.D., 2000, Columbia University: Operating systems; file systems; storage; networking; software engineering; security.

Zelinsky, Gregory J., Ph.D., 1994, Brown University: Visual search; visual working memory; object detection and recognition; visual attention and eye movements; scene perception and representation.

#### Assistant Professors

Gao, Jie, Ph.D., 2004, Stanford University: Algorithms; ad hoc communication and sensor networks; computational geometry.

Gu, Xianfeng, Ph.D., 2004, Harvard University: Computer graphics; computer vision; medical imaging; computational conformal geometry; global differential geometry; harmonic analysis; computational algebraic topology; computational optics; biometrics.

Gupta, Himanshu, Ph.D., 1999, Stanford University: Databases, data mining, data warehousing.

Johnson, Robert, Ph.D., 2007, University of California, Berkeley: Software security; system and network security; cryptography; digital rights management; operating systems; networks; algorithm design and analysis.

Lv, Qin, Ph.D., 2006, Princeton University: Development of efficient systems for managing and exploring massive amounts of digital data. Focus on search systems, data management, distributed systems, storage systems and networking, but also spans the areas of algorithm design, machine learning, data mining, and specific application domains such as multimedia, bioinformatics, sensor networks, healthcare, and scientific computing.

Rizzo, Robert, Ph.D., 2001, Yale University: Computational Biology.

Sion, Radu, Ph.D., 2004, Purdue University: Data security and privacy in distributed networked environments.

Stent, Amanda, Ph.D., 2001, University of Rochester: Natural language processing.

Vasilescu, M. Alex O., , University of Toronto: Computer vision; computer graphics; tensor algebra; physics-based modeling; machine learning.

Wong, Jennifer, Ph.D., 2006, University of California, Los Angeles: Interaction of statistical models and optimization for CAD and embedded systems, low power wireless communication, and sensor networks.

Number of teaching, graduate, and research assistants, Fall 2006: 120

Affiliated Faculty for Program in Information Systems Engineering  
Tzi-cker Chiueh, Computer Science

Alex Doboli, Electrical and Computer Engineering

Petar Djuric, Electrical and Computer Engineering

Dmitri Donetski, Electrical and Computer Engineering

Eugene Feinberg, Applied Mathematics

Peisen Huang, Mechanical Engineering

Imin Kao, Mechanical Engineering

Arie E. Kaufman, Computer Science

Robert F. Kelly, Computer Science

W. Brent Lindquist, Applied Mathematics

Lilianne Mujica-Parodi, Biomedical Engineering

John Murray, Electrical and Computer Engineering

Thomas G. Robertazzi, Electrical and Computer Engineering

Tian-Lih Teng, Technology & Society

Rong Zhou, Computer Science

Executive Committee of Program in Information Systems Engineering

Petar Djuric Electrical and Computer Engineering

Arie E. Kaufman, Computer Science

Robert F. Kelly, Computer Science

W. Brent Lindquist, Applied Mathematics

Thomas G. Robertazzi, Electrical and Computer Engineering

Tian-Lih Teng, Technology & Society

Rong Zhou, Computer Science

*NOTE: The course descriptions for this program can be found in the corresponding program PDF or at COURSE SEARCH.*