

PROPOSAL TO OFFER A NEW ACADEMIC PROGRAM/ MAJOR IN FALL 2005

(LONG FORM)

Proposed Name of Degree: Bachelor of Science in Information Technology
Options/ Emphases in the Degree:
Faculty Proposing New Program: Peter Smith, William Wolfe, Ivona Grzegorzcyk

Review and Approval:

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

PROCEDURE FOR SUBMITTING PROPOSALS FOR NEW PROGRAMS

1. Definition of the Proposed Degree Major Program

- a. **Name of the campus submitting the request, the full and exact designation (degree terminology) for the proposed degree major program, and academic year of intended implementation.**

California State University Channel Islands
Bachelor of Science in Information Technology
Fall 2005

- b. **Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility.**

Computer Science.

- c. **Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.**

William Wolfe, PhD
Professor of Computer Science

Peter Smith, PhD
Professor of Computer Science

Ivona Grzegorzcyk, PhD
Professor of Mathematics

- d. **Objectives of the proposed degree major program.**

This BSIT program is specifically designed to provide an avenue of advancement for students with associates degrees in a technology discipline such as networking (e.g.: Moorpark College's Associate in Science Degree in Computer Network Systems Engineering). This new program gives the student the opportunity to complete a Bachelor of Science degree in Information Technology. The course work will provide a foundation in mathematics, programming, networking, databases, web, computer architecture and information systems. The BSIT sits between a BS in Computer Science and a BS in Management Information Systems, emphasizing the fastest growing segments of the both: Web Systems, Databases, and Networks. For a foundation, the BSIT program draws from both camps: mathematics, science, and computer programming from Computer Science, and business organization and project management from Management Information Systems. From there it adds depth in Web Programming and Technology, Database Theory and Design, and Data Communications and Networking, while allowing for further depth in these or related areas such as e-Commerce, Computer Security, and Multimedia.

- e. **Total number of units required for the major. List of all courses, by catalog number, title, and units of credit, to be specifically required for a major under the proposed degree program. Identify those new courses that are (1) needed to initiate the program and (2) needed during the first two years after implementation—~~(Complete Table 1)~~. Include proposed catalog descriptions of all new courses.**

BSIT Program Requirements

A total of 120 Semester units are required for the BSIT.

Lower Division Requirements (60 units)

Students entering this program are expected to have completed an associate's degree (or equivalent) in a technology area, including:

- a. Statistics.
- b. One semester of a Laboratory science (Physics, Chemistry, or Biology).
- c. First course in a computer programming language such as C, Java or C++.
- d. First course in Computer Architecture and Assembly Language.
- e. CSU GE Certification or courses fulfilling the CSUCI lower division general education requirements.
- f. A minimum of 15 units of lower division coursework in a technology area (computer technology, electronics technology, manufacturing technology, engineering, computer science, etc.).

Students who have not completed these 60 units prior to their admission to the program will be required to complete them at CSUCI or a community college. Course substitutions for these requirements may be made with the approval of the department chair.

(Continued on the next page).

(section 1e, continued)

Upper Division Requirements:

Mathematics and Science Requirements (7 Units)

Math	300	Discrete Mathematics I	3
Lab Science	II	(Physics, Chem., or Bio.)	4
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			7

Core Courses (24 Units)

IT	151	Data Structures for IT	3
IT	262	Computer Organization for IT	3
IT	280	Web Programming	3
IT	429	Computer Networks for IT	3
IT	420	Database Theory and Design for IT	3
IT	362	Operating Systems for IT	3
CIS	310	Management Information Systems	3
MGT	320	Management of Organizations	3
			<hr/>
			24

Upper Division Interdisciplinary GE (9 Units)

As a graduation requirement, all CSUCI students must complete 48 units of General Education. Nine of the 48 units must be resident upper division, interdisciplinary courses numbered in the 330-349 or 430-439 ranges.

Electives (15 units)

Choose 15 units from:

IT	400	eCommerce	3
IT	401	Web Intelligence	3
IT	424	Computer System Security for IT	3
IT	402	Advanced IT Programming	3
IT	464	Computer Graphics for IT	3
IT	469	AI and Neural Networks for IT	3
IT	430	Advanced DB Systems	3
IT	490	Special Topics for IT	3
COMP	452	Computational Bioinformatics	4
ART	324	Commun. Design Technology: Web Design	3
ART	326	Digital Media Art: 3D Computer Animation	3
			(Additional electives to be added based on faculty availability).
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Capstone (5 units)

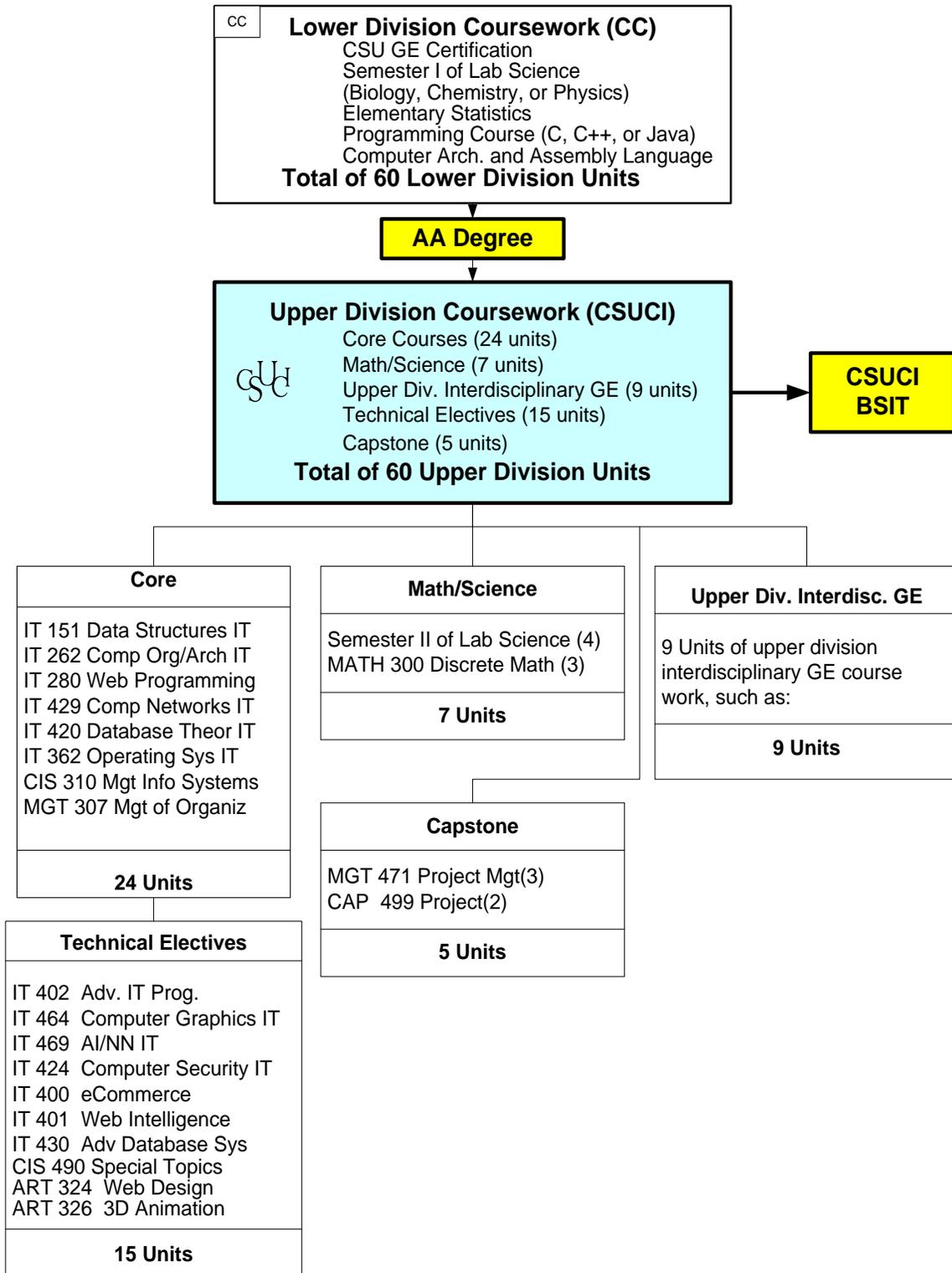
MGT	471	Project Management	3
IT	499	Capstone Project	2
			<hr/>
			5

BSIT Summary (120 units)

Lower Division Requirements	(units: 60)
Mathematics and Science Requirements	(units: 7)
Core Courses	(units: 24)
Upper Division Interdisciplinary GE	(units: 9)
Upper Division Electives	(units: 15)
Capstone	(units: 5)

120

(section 1e, continued)



(section 1e, continued)

Catalog Descriptions of New Courses:

IT 151 Data Structures for IT (3)

Three hours of lecture in the lab per week. Introduction to data structures and the algorithms that use them. Review of composite data types such as arrays, records, strings and sets. Topics include: abstract data types, stacks, queues, linked lists, trees and graphs, recursion, and time complexity. Course designed for IT majors.

Prerequisites: COMP 150 First course in programming (C, C++, or Java).

IT 262 Computer Organization and Architecture for IT (3)

Overview of main system components: CPU, main memory, secondary memory, input/output. Data representation. Digital logic. PC Architecture. CISC and RISC. RAM and cache memories. Disks and RAID. Instruction set design. Input/Output and bus technology. Other architectures. Benchmarking. Trends in computer architecture. Three hours of lecture per week.

Prerequisites: COMP 162

IT 280 Web Programming (3)

Three hours of lecture in the lab. This course provides an overview of the many languages and techniques used in web programming. This includes Java, JavaScript, PHP, Python, Perl, JSP and ASP, as well as database query languages and XML. Sample applications are built for dynamic web pages and web sites.

Prerequisites: MATH 300 IT 151

IT 362 Operating Systems for IT (3)

Examination of the principal types of operating systems including batch, multi-programming, and time-sharing. Networked systems are also discussed. The salient problems associated with implementing systems are considered including interrupt or event driven systems, multi-tasking, storage and data base management, and input-output. Role and tasks of system administrator. System management tools. Case analysis of systems such as DOS/Windows, Linux/Unix, VMS. Projects will be implemented to reinforce the lectures.

Prerequisites: IT 262

IT 400 eCommerce (3)

Three hours of lecture in the lab.

Fundamentals of database driven web sites. Online accounts, cookies, shopping carts, data collection and storage, and data security. Covers user interface design, navigation and site search strategies and database support.

Prerequisites: IT 280 IT 420

IT 401 Web Intelligence (3)

Three hours of lecture in the lab.

Using web programming to extract information, using intelligent search engines, artificial intelligence techniques (expert systems, agents). Topics include: data mining, data warehousing, natural language processing, decision support systems, and intelligent agents.

Prerequisites: IT 402 Advanced IT Programming.

IT 402 Advanced IT Programming (3)

Three hours of lecture in the lab. Covers a variety of programming languages, including java, c, c++, perl, asp, and php. This course focuses on building applications that are useful to IT professionals, such as applications for network security, maintenance and surveillance.

Prerequisites: IT 280

(section 1e, continued)

IT 420 Database Theory and Design for IT (3)

Three hours of lecture in the lab per week.

Database structure including: structure definition, data models, semantics of relations, and operation on data models. Database schemas: element definition, use and manipulation of the schema. Elements of implementation. Algebra of relations on a database. Hierarchical data bases. Discussion of information retrieval, reliability, protection and integrity of databases.

Prerequisites: MATH 300

IT 424 Computer System Security for IT (3)

Security techniques and practices in operating systems, databases and computer networks. Analysis of formal security models. Introduction to the OSI Security Architecture, cryptography, public key security systems and firewalls.

Prerequisites: IT 429

IT 429 Computer Networks for IT (3)

Basic software design and analysis considerations in networking computers into coherent, cooperating systems capable of processing computational tasks in a distributed manner. Network topology, routing procedures, message multiplexing and process scheduling techniques.

Prerequisites: IT 362

IT 464 Computer Graphics for IT (3)

Three hours of lecture in the lab per week.

Fundamental concepts of computer graphics. Graphics devices; graphics languages; interactive systems. Applications to art, science, engineering and business. Trade-offs between hardware devices and software support.

Prerequisites: MATH 300 IT 151

IT 469 Artificial Intelligence/Neural Networks for IT (3)

Three hours of lecture in the lab per week.

An exploration of the use of computers to perform computations normally associated with intelligence, pattern formation and recognition using various backpro iterations. Stacks, decision trees and other modern mining tools and computational models for knowledge representation will be covered. Other topics may include natural language and imaging.

Prerequisites: MATH 300 IT 151

IT 472 BSIT Capstone (2)

Implement a realistic Information Technology project. Identify project goals in consultation with an industry representative. Produce the project requirements, design and complete documentation. Implement the project design, test and debug the system. Present the project results to the class and the industry representative. Work in teams.

Prerequisites: MGT 4xx Senior standing in the BSIT program.

IT 490 Special Topics for IT (3)

The course addresses current issues in Information Technology. Specialized topics will be studied. May be repeated as topics change.

Prerequisites: (No specific course.) Senior standing in the BSIT program.

- f. **List of elective courses, by catalog number, title, and units of credit that can be used to satisfy requirements for the major. Identify those new courses that are (1) needed to initiate**

the program and (2) needed during the first two years after implementation—(Complete Table 1). Include proposed catalog descriptions of all new courses.

The course listings in section 1e provide this information.

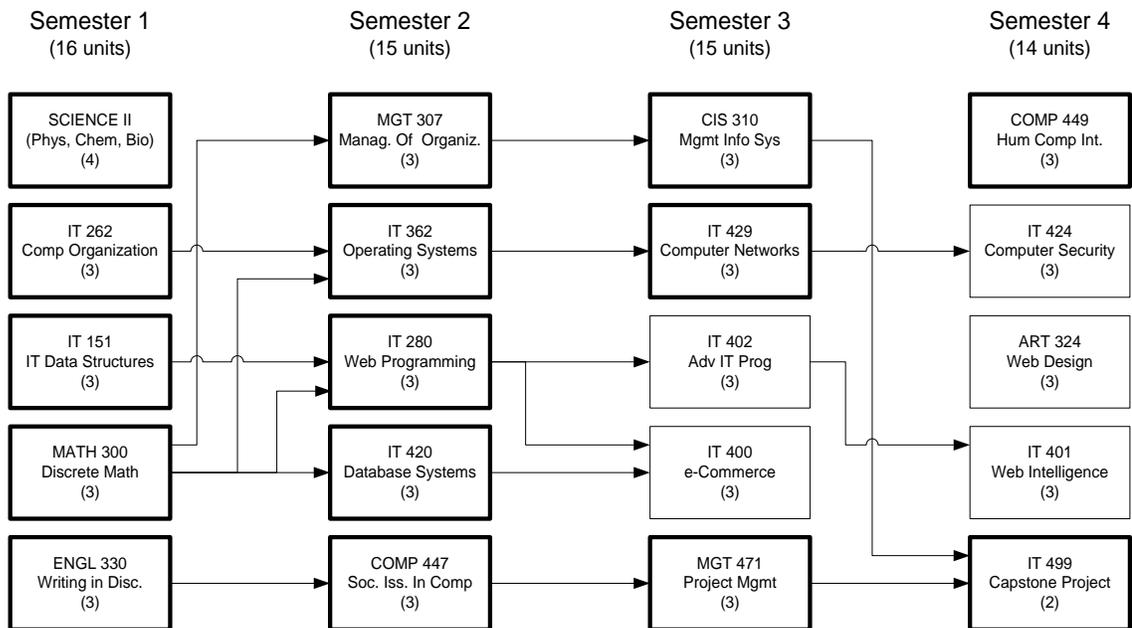
g. If any formal options, concentrations, or special emphases are planned under the proposed major, explain fully.

It is expected that the student will select electives that emphasize one of the following themes: Web Technology, Computer Security, Database Systems, or Network and Computer Architectures.

Each student will consult with the BSIT advisor and select the appropriate available courses as they add depth in any of these areas.

For example, a student entering the BSIT program is expected to have already satisfied the lower division requirements described earlier, typically at a community college. The two years of upper division course work: (see figure on next page).

Typical BSIT Plan of Study (Emphasis in Web Technology)



Notes

1. The bold boxes are required courses.
2. Thin line boxes are electives.
3. Lines and arrows indicate prerequisites.

- h. Course prerequisites and other criteria for admission of students to the proposed degree major program, and for their continuation in it.**

BSIT Prerequisites:

Students entering this program are expected to have completed an associate's degree (or equivalent) in a technology area, including:

- a. Statistics.
- b. One semester of a Laboratory science (Physics, Chemistry, or Biology).
- c. First course in a computer programming language such as C, Java or C++.
- d. First course in Computer Architecture and Assembly Language.
- e. CSU GE Certification or courses fulfilling the CSUCI lower division general education requirements.
- f. A minimum of 15 units of lower division coursework in a technology area (computer technology, electronics technology, manufacturing technology, engineering, computer science, etc.).

Students who have not completed these 60 units prior to their admission to the program will be required to complete them at CSUCI or a community college. Course substitutions for these requirements may be made with the approval of the department chair.

- i. Explanation of special characteristics of the proposed degree major program, e.g., in terminology, units of credit required, types of course work, etc.**

This BSIT program is specifically designed to provide an avenue of advancement for students with associates degrees in a technology discipline such as networking (e.g.: Moorpark College's Associate in Science Degree in Computer Network Systems Engineering). This new program gives the student the opportunity to complete a Bachelor of Science degree in Information Technology. The course work will provide a foundation in mathematics, programming, networking, databases, web, computer architecture and information systems.

CSUCI is working closely with the local community colleges on this project. The CC's feel strongly that a BSIT at CSUCI is in big demand, and that it will help to strengthen their technology programs, which typically reach a dead end at the Associate's level. The CC's have worked with CSUCI to build a program that will provide many of their technology students a clear path to a 4 year degree.

- j. For undergraduate programs, provisions for articulation of the proposed major with community college programs.**

CSUCI has worked closely with the local CC's and have identified the basic articulation requirements.

Students entering this program are expected to have completed an associate's degree (or equivalent) in a technology area, including:

- a. Statistics.

- b. One semester of a Laboratory science (Physics, Chemistry, or Biology).
- c. First course in a computer programming language such as C, Java or C++.
- d. First course in Computer Architecture and Assembly Language.
- e. CSU GE Certification or courses fulfilling the CSUCI lower division general education requirements.
- f. A minimum of 15 units of lower division coursework in a technology area (computer technology, electronics technology, manufacturing technology, engineering, computer science, etc.).

Students who have not completed these requirements prior to their admission to the program will be required to complete them at CSUCI or a community college. Course substitutions for these requirements may be made with the approval of the department chair.

- k. Provision for meeting accreditation requirements, where applicable, and anticipated date of accreditation request.**

The program is designed in accordance with the major accrediting body ABET:

Accreditation Board for Engineering and Technology, Inc.

111 Market Pl., Suite 1050
Baltimore, MD 21202
(410) 347-7700
(410) 625-2238 (Fax)

Currently, ABET has specific accreditation criteria for Information Systems and Software Engineering, but not for Information Technology. A subcommittee of the ACM (Association of Computing Machinery), the special interest group on information technology education (SIGITE), is currently working on the criteria. Professor Wolfe is on that committee. The committee will meet on October 28, 2004, in Salt Lake City, Utah, and Professor Wolfe will attend the meeting to be sure that our program meets the criteria when it is finally published.

We expect to apply for ABET accreditation in Information Technology in Fall of 2008.

2. Need for the Proposed Degree Major Program

- a. List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.**

We know of no other CSU campus that offers a BSIT, although there is a BS Information Systems program offered at CSUN, College of Business and Economics, in the Department of Accounting and Information Systems, that has some similarities.

We know of no other local institution that offers a BSIT program.

b. Differences between the proposed program and programs listed in Section 2a above.

The CSUN degree is a B.S. in Information Systems with an option in Information Technology, it is not an Information Technology degree. It is a combination of computer science and business courses. There are also courses referred to as IS courses. However, the main focus is "business" since that is the school offering the course work.

Furthermore, the CSUCI BSIT program is designed to be compatible with the lower division technology programs being offered in community colleges across the state of CA. The CSUN program has many lower division requirements, such as Engineering Calculus, that those technology students do not typically have.

Similarly, local institutions that offer related degrees, such as Information Systems, are heavily vested in Business courses, as opposed to Technology courses.

f. Professional uses of the proposed degree major program.

Potential career options for BSIT graduates include: Computer Systems Integrator, Computer Systems Manager, Information Technology Designer, Information Technology Support, Database Systems Manager, Database Systems Designer, Data Communications Analyst, Network Manager, Network Designer, Web Technology Manager, Web Technology Support.

Information technology continues to be at the backbone of all business enterprises. Although there are computer science programs and business programs that provide support for this high demand area, there are no programs that fill the gap between the highly analytical/theoretical computer science programs and the mostly managerial business programs. In particular, this BSIT program will provide an avenue of advancement for the many students graduating from the community colleges with technology oriented degrees.

The BSIT is meant to satisfy a community/regional/statewide need for a program that emphasizes the fast growing segments of enterprises: Web Technology, Databases, and Networks. For a foundation, the BSIT program draws from: basic mathematics, science, and computer programming from Computer Science, and basic business organization and project management from Management Information Systems. From there it adds depth in Web Technology, Database Theory and Design, and Data Communications and Networking, while allowing for area concentrations in any of these or related areas such as e-Commerce, Computer Security, and Multimedia.

Also:

1. Network systems and data communications analysts are projected by the Bureau of Labor Statistics to be the second fastest growing occupation over the period from 2002 to 2012. See:

<http://www.bls.gov/news.release/ecopro.t04.htm>

2. Computer systems design and related services, and Internet services, data processing and other information services are two industries with the fastest projected wage and salary growth between 2002 and 2012. See: <http://www.bls.gov/news.release/ecopro.t03.htm>

3. Employment in computer and mathematical occupations is expected to grow over 34% in the period from 2002 to 2012. This is the highest projected growth of all major occupational groups as specified by the Bureau of Labor Statistics. See: <http://www.bls.gov/news.release/ecopro.t02.htm>

g. The expected number of majors in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation and three years and five years thereafter.

	<u>Number of Majors</u>	<u>Number of Graduates</u>
Initiation Year	20	0
Third year	60	40
Fifth year	150	80

(from CSU Channel Islands Enrollments Models)

3. Existing Support Resources for the Proposed Degree Major Program

a. Faculty members, with rank, appointment status, highest degree earned, date and field of highest degree, and professional experience (including publications if the proposal is for a graduate degree), who would teach in the program.

BRIEF FACULTY BIOGRAPHIES (up to 3 relevant publications listed).

Ivona Grzegorzcyk

Professor of Mathematics

PhD in Mathematics, UC Berkeley, 1990

Mathematics Professor since 1990

Extensive experience in the areas of algebraic geometry, moduli problems, applied mathematics, mathematics education.

Selected publications:

1. On Newstead's Conjecture on Vector Bundles on Algebraic Curves, *Mathematischen Annalen* 300, 521-541(1994).
2. *Mathematics and Fine Arts*, Kendall/Hunt publishing Co., (2000) .
3. Geography of Brill-Noether Loci for Small Slopes (with L. Brambila-Paz and P. Newstead), *Journal of Algebraic Geometry*. 6 (1997).

Peter Smith

Professor of Computer Science

PhD in Computer Studies, Lancaster University, 1975

Computer Science Professor since 1980

Extensive experience in the areas of data structures and algorithms

Selected publications:

1. Applied Data Structures with C++ , Jones and Bartlett, 2004
2. Experiments with word-by-word compression of English text using lexicons, **Computer Journal**, 1992.
3. Experiments with a very fast substring search algorithm, **Software-Practice and Experience**, 1991.

William Wolfe

Professor of Computer Science

PhD in Mathematics, CUNY, 1976

Computer Science Professor since 1988

Extensive experience in Neural Networks, Artificial Intelligence, Databases.

Selected publications:

1. Student Peer Reviews in an Upper Division Mathematics Class, **Exchanges: The Online Journal of Teaching and Learning in the CSU**, September
2. Thee Scheduling Algorithms Applied to the Earth Observing Systems Domain **INFORMS Journal on Management Science**, Vol. 46, No. 1, January 2000 pp. 148-
3. A Fuzzy Hopfield-Tank TSP Model **INFORMS Journal on Computing**, Vol. 11, No. 4, Fall 1999 pp. 329-

Geoffrey Dougherty

Professor of Physics

Ph.D. in Biophysics, University of Keele, 1979

Medical Imaging/Physics Professor since 1986

Extensive experience in medical imaging, image analysis, and bioengineering.

Selected publications:

1. Dougherty, G and Henebry, G. Lacunarity analysis of spatial pattern in CT images of vertebral bone for assessing osteoporosis. *Med. Eng. Phys.*, 2002, **24**, 129-138.
2. Dougherty, G. and Kawaf Z. The point spread function revisited: image restoration using 2-D convolution. *Radiography*, 2001, **7**, 255-262.
3. Dougherty, G. and Henebry, G. Fractal signature and lacunarity in the measurement of the texture of trabecular bone in clinical CT images. *Med. Eng. Phys.*, 2001, **23**, 369-380.

Jesse Elliot

Assistant Professor of Mathematics

PhD in Mathematics, UC Berkeley, 2003

Mathematics Professor since 2003

Experience in commutative algebra and number theory.

Selected publications:

- 1 Witt-Burnside Rings (dissertation), UC Berkeley, 2003
- 2 Binomial Rings (preprint on website)

Jorge Garcia

Assistant Professor of Mathematics

PhD in Mathematics, U-W Madison, 2002

Mathematics Professor since 2002

Extensive experience in Stochastic Processes, Large Deviations, Stochastic Integrals, Probability, Markov Processes and Measure Theory.

Selected publications:

1. An Extension of the Contraction Principle, Journal of Theoretical Probability, October, 2003
 2. A Large Deviation Principle for Stochastic Integrals (In Preparation)
- Three additional full-time professors in the Computer Science and Mathematics areas are planned for Fall 2005
 - Other CSUCI full-time science faculty will offer interdisciplinary and computation intensive application courses.

This program will require classroom space, computer laboratory space, library materials, library electronic databases and the use of Information Technology (IT) resources.

4. Additional Support Resources Required

- b. Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.**

Ph.D. degrees in Computer Sciences or closely related fields. Since this is a "self support" program, all hiring of additional faculty will be handled via the Office of Extended Education

- c. The amount of additional lecture and/or laboratory space required to initiate and sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy.**

This program will be offered as "self support" and therefore all additional lab space will be negotiated for a price through the Office of Extended Education. Since all students are going to be technology literate, some of the courses (or part if the courses) will be offered on-line. This would give the opportunity for local working professionals to participate in the program.

- d. Additional library resources needed. Indicate the commitment of the campus to purchase or borrow through interlibrary loan these additional resources.**

No additional library resources needed above the existing CSUCI Library acquisition program.

- e. Additional equipment or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.**

Computer lab equipment will be rented or purchased via the Office of Extended Education and will therefore not have an impact on exiting CSUCI labs.

5. Abstract of the Proposal and Proposed Catalog Description

BSIT PROGRAM (CATALOG DESCRIPTION)

This BSIT program is specifically designed to provide an avenue of advancement for students with associates degrees in a technology discipline such as networking (e.g.: Moorpark College's Associate in Science Degree in Computer Network Systems Engineering). This new program gives the student the opportunity to complete a Bachelor of Science degree in Information Technology. The course work will provide a foundation in mathematics, programming, networking, databases, web, computer architecture and information systems. The BSIT sits between a BS in Computer Science and a BS in Management Information Systems, emphasizing the fastest growing segments of the both: Web Systems, Databases, and Networks. For a foundation, the BSIT program draws from both camps: mathematics, science, and computer programming from Computer Science, and business organization and project management from Management Information Systems. From there it adds depth in Web Programming and Technology, Database Theory and Design, and Data Communications and Networking, while allowing for further depth in these or related areas such as e-Commerce, Computer Security, and Multimedia. Students entering this program are expected to have already attained an associates degree in a technology area (or the equivalent), with at least 30 units that are "GE certified" for the CSU system, including courses in: Statistics, First Course in a Laboratory science (Physics, Chemistry, or Biology), First course in a programming language (such as C, Java, or C++), Computer Architecture and Assembly Language.

CAREERS: Potential career option for BSIT graduates include: Computer Systems Integrator, Computer Systems Manager, Information Technology Designer, Information Technology Support, Database Systems Manager, Database Systems Designer, Data Communications Analyst, Network Manager, Network Designer, Web Technology Manager, Web Technology Support.

CONTACT INFORMATION

compsci.csuci.edu

FACULTY

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William Wolfe, Ph. D.
Professor of Computer Science
Computer Science Program Chair
Bell Tower 2225
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REQUIREMENTS FOR THE BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY (120 UNITS)

Lower Division Requirements

Students entering this program are expected to have completed an associate's degree (or equivalent) in a technology area, including:

- Statistics.
- One semester of a Laboratory science (Physics, Chemistry, or Biology).
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IT	401	Web Intelligence	3
IT	424	Computer System Security for IT	3
IT	402	Advanced IT Programming	3

IT	464 Computer Graphics for IT	3
IT	469 AI and Neural Networks for IT	3
IT	430 Advanced DB Systems	3
IT	490 Special Topics for IT	3
COMP	452 Computational Bioinformatics	4
ART	324 Commun. Design Technology: Web Design	3
ART	326 Digital Media Art: 3D Computer Animation	3
(Additional electives to be added based on faculty availability).		

15

Capstone (5 units)

MGT	471 Project Management	3
IT	499 Capstone Project	2

5

BSIT Summary (120 units)

Lower Division Requirements	(units: 60)
Mathematics and Science Requirements	(units: 7)
Core Courses	(units: 24)
Upper Division Interdisciplinary GE	(units: 9)
Upper Division Electives	(units: 15)
Capstone	(units: 5)

120

PROPOSED COURSE OF STUDY

Junior Year

Fall:

- Science II (Bio, Chem, or Phys). (4)
- IT 262 Computer Organization (3)
- IT 151 Data Structures for IT (3)
- Math 300 Discrete Mathematics (3)
- Engl 330 Writing in a Discipline (3)

Spring:

- MGT 307 Management of Organizations (3)
- IT 362 Operating Systems for IT (3)
- IT 280 Web Programming (3)
- IT 420 Database Systems for IT (3)
- Comp 447 Societal Issues in Computing (3)

Senior Year

Fall:

- CIS 310 Management Information Systems (3)
- IT 429 Computer Networks (3)
- IT 402 Advanced IT Programming (3)
- IT 400 e-Commerce (3)
- MGT 471 Project Management (3)

Spring:

Comp 429 Human Computer Interaction (3)

IT 424 Computer System Security for IT (3)

Art 324 Web Design (3)

IT 401 Web Intelligence (3)

IT 499 Capstone Project (2)