

CSU Channel Islands
Pilot Conversion Form
Program to be Converted:
Master of Science in Computer Science
September 22, 2010

CSU Degree Program Proposal Template

1. Program Type
(Please retain any from the list below that apply—then delete the others)

√ [Pilot Conversion](#)

2. CPEC COVER PAGE (required for graduate programs only)

The California Post-Secondary Education Commission now requires for each graduate program proposed, a table of contents cover page that lists the following review criteria and that identifies the page numbers on which those criteria are addressed in the proposal. The criteria include:

CRITERION	PAGE
<ul style="list-style-type: none"> • Student demand.....15 This can be demonstrated with surveys of student intention to enroll in the program. Include current and projected enrollments of related existing programs at the proposing campus or feeder institutions. • Societal Needs.....13 The proposal should establish that there will be sufficient employment opportunities for graduates of the proposed program. Workforce demand projections can be helpful in establishing the balance between graduates and employment opportunities. Letters from regional employers are helpful, as well. Workforce data are available at: http://www.calstate.edu/app/workforce_data.shtml • Appropriateness to Institutional and Segmental Mission.....3, 4 , 13 Describe how the proposed degree program fits with the campus, school/college, and departmental missions. • Number of Existing and Proposed Programs in the Field.....13 Demonstrate how the proposed program differs from or is similar to existing programs in the state. • Total Costs for the Program.....15, 17 Are there sufficient funds available to support the resources that are required in order to initiate and maintain the program, including: the number of new faculty required; equipment; library resources; and classroom, office, and laboratory facilities. Identify the source of the funds required to support the program, both initially and in the long run. • Maintenance and Improvement of Quality.....5, 6 	

Submit formal assessment plans that address program goals and student learning outcomes. Goals should be measurable; plans should be manageable, and data should be meaningful. Goals should be related to institutional and program mission, and to the curriculum. See the CSU assessment site for further information:

<http://www.calstate.edu/acadaff/sloa/index.shtml>

• **Advancement of Knowledge.....14**

Describe how the program will contribute to the growth and development of intellectual and creative scholarship.

3. Program Identification

- a. Campus: [CSU Channel Islands](#)
- b. Full and exact degree designation and title (e.g. Master of Science in Genetic Counseling, Bachelor of Arts with a Major in History). [Master of Science in Computer Science](#)
- c. **Total number of Units Required.** A justification is required later in the proposal for any proposed undergraduate program requiring more than 120 semester units, 180 quarter units. [Total units for the MS in Computer Science is 32 semester units.](#)
- d. Date the Board of Trustees approved adding this program projection to the campus Academic Plan. [CSU Channel Islands received authorization to offer the MS in Computer Science special sessions pilot program on October 21, 2006. Board of Trustees approved the program as a projection on our master plan on March 2005.](#)
- e. Term and academic year of intended implementation (e.g. Fall 2007). [Fall 2006](#)
- f. Name of the department(s), division, or other unit of the campus that would offer the proposed degree major program. Please identify the unit that will have primary responsibility. [Degree offered through special sessions, that is through Extended University.](#)
- g. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program. [Program drafted by Andrzej Bieszczad, Associate Professor of Computer Science, and Director of the Master of Science in Computer Science Program. Email contact: \[William.wolfe@csuci.edu\]\(mailto:William.wolfe@csuci.edu\); \[peter.smith@csuci.edu\]\(mailto:peter.smith@csuci.edu\); \[aj.bieszczad@csuci.edu\]\(mailto:aj.bieszczad@csuci.edu\)](#)
- h. Statement from the appropriate campus administrative authority that the addition of this program supports the campus mission and will not impede the successful operation and growth of existing academic programs. (**CPEC “Appropriateness to Institutional and Segmental Mission”**) [See exhibits for letters from Dr Dawn Neuman, provost and Dr Gary Berg, Associate Vice-President and Dean of Extended University \(Exhibits 2 and 4\).](#)
- i. Any other campus approval documents that may apply (e.g. curriculum committee approvals). [The degree received approval from the Academic Senate on November 16, 2004, and from the president, Dr Richard Rush on November 30, 2004 \(See Exhibit 5\).](#)
- j. Please specify whether this proposed program is subject to WASC Substantive Change review.

[The MS in Computer Science is not subject to WASC Substantive Change review. CSU Channel Islands received its initial WASC accreditation in July 2007, subsequent to the implementation of the MS in Computer Science and thereby approving this program and its other initial undergraduate and graduate degrees](#)

k. **Optional: Proposed Classification of Instructional Programs (CIP) Code and CSU Degree Program Code**

Campuses are invited to suggest one CSU degree program code and one corresponding CIP code. If an appropriate CSU code does not appear on the systemwide list at:

http://www.calstate.edu/app/documents/HEGIS-CIP2000_102406.xls, you can search CIP 2000 at <http://nces.ed.gov/pubs2002/cip2000/> to identify the code that best matches the proposed degree program. The Classification of Instructional Programs (CIP) is a National Center for Education Statistics (NCES) publication that provides a numerical classification and standard terminology for secondary and postsecondary instructional programs. The CSU degree program code (based on old HEGIS codes) and CIP code will be assigned when the program is approved by the Chancellor. Program codes 07011 was assigned from the Chancellor's Office October 21, 2006 (Exhibit 1).

4. Program Overview and Rationale

- a. Rationale, including a brief description of the program, its purpose and strengths, fit with institutional mission, and a justification for offering the program at this time. The rationale may explain the relationship among the program philosophy, design, target population, and any distinctive pedagogical methods. (CPEC “Appropriateness to Institutional and Segmental Mission”)

The Master of Science in Computer Science degree at Channel Islands offers the latest, cutting edge education for a variety of industrial and applied fields. The program prepares students for careers in high-tech, computer and Internet-driven industries, businesses, education systems, military, and local and federal government where interdisciplinary, dynamic and innovative professionals trained in latest technologies are increasingly sought. Students are given a strong background in computer theory, software and hardware, as well as skills to conduct independent applied research and develop an industrial project. The program stresses interdisciplinary applications with emphasis on breadth of knowledge in computer science to prepare students for a wide range of possible industry, academic, and research positions.

The program that includes 24 units of advanced coursework, 2 units of seminar, and 6 units of supervised graduate research, culminates with a formal Master Thesis defense in front of an examination committee. All theses are published in electronic book form through the university library.

- b. Proposed catalog description, including program description, degree requirements, and admission requirements. For master's degrees, please also include catalog copy describing the culminating experience requirement(s).

The MS in Computer Science prepares students for advanced careers in high-tech, computer-driven industries, including applications to business, aerospace, education, military, and government where interdisciplinary, dynamic and innovative professionals trained in latest technologies are increasingly sought. Students develop a strong background in computer theory, software and hardware, as well as skills to conduct applied research. The program stresses interdisciplinary applications while preparing students for a wide range of industry, academic, and research positions.

<http://www.cs.csuci.edu/MSCS/>

Admission

Students seeking admission are expected to have an undergraduate degree in computer science, mathematics, engineering, or science. Other majors will be considered on a case by case basis. The applicant is expected to have a 2.7 or higher cumulative undergraduate grade point average (GPA). A GRE report is also required for applicant whose GPA is less than 3.0.

Graduation

To obtain the degree, the student must complete each course with a minimum grade of B, and defend a thesis before an examination committee.

Required Courses - 32 units

COMP	599	Graduate Seminar	2
COMP	597	Thesis	6
Electives (minimum of <u>18</u> units must be COMP)			24

Electives - 24 units

A minimum of 18 units must be COMP

COMP	510	Algorithms	3
COMP	520	Advanced Database Systems	3
COMP	524	Security	3
COMP	529	Network Computing	3
COMP	549	Human-Computer Interaction	3
COMP	550	Advanced Software Engineering	3
COMP	566	Geometry and Computer Graphics	3
COMP	569	Artificial Intelligence	3
COMP	571	Biologically Inspired Computing	3
COMP	572	Neural Networks	3
COMP	575	Multi-agent Systems	3
COMP	578	Data Mining	3
COMP	590	Special Topics in Computer Science	3
COMP	581	Mathematical Methods in Artificial	
..... Intelligence (MATH)	3		
COMP	597	Master Thesis	1-6
COMP	599	Graduate Seminar	1
MATH	510	Probabilistic Methods &	
.....		Measure Theory	3
MATH	511	Functional Analysis	3
MATH	555	Actuarial Sciences	3
MATH	565	Research In Mathematics Education	3
MATH	582	Number Theory And Cryptography	3
MATH	584	Algebraic Geometry & Coding Theory	3
MATH	587	Markov Chains & Markov Processes	3
MATH	588	Stochastic Analysis	3
PHYS	510	Advanced Image Analysis Techniques	3
PHYS	546	Pattern Recognition	3

Graduate Writing

Assessment Requirement

Writing proficiency prior to the awarding of the degree is demonstrated by successful completion of COMP 597 Masters Thesis with a grade of B or higher.

5. Curriculum

- a. Goals for the (1) program and (2) [student learning outcomes](#). Program goals are very broad statements about what the program is intended to achieve, including what kinds of graduates will be produced. Student learning outcomes are more specific statements that are related to the program goals but that more narrowly identify what students will know and be able to do upon successful completion of the program.

[Program Learning Outcomes](#)

Students graduating from the Computer Science program will be able to:

- Demonstrate critical thinking and problem solving skills by identifying, evaluating, analyzing and presenting fundamental software solutions and their applications;
- Demonstrate the knowledge of current computing practices and broad technology use in industry and society, including a working knowledge of software development techniques;
- Be cognizant of emerging new technologies and industrial practices connected to the computer industry;
- Demonstrate communication, research and cooperation skills by working effectively with others in interdisciplinary group settings - both inside and outside the classroom; and
- Demonstrate a sense of exploration that enables them to pursue rewarding careers in high- tech and bio-tech industries with life-learning.

Student Learning Objectives

Students will:

Demonstrate critical thinking, problem solving, and advanced computational skills by identifying, evaluating, analyzing, synthesizing and presenting fundamental and advanced mathematical and computer science issues and their applications.

Demonstrate the knowledge of current computing practices and broad technology use in industry and education, including a working knowledge of software development techniques in various settings.

Be knowledgeable of emerging new technologies and industrial practices connected to the computer industry and demonstrate understanding of computing technologies in society.

Demonstrate cooperation skills by working effectively with others in interdisciplinary group settings – both inside and outside the classroom.

Demonstrate independent working and thinking skills by completing a graduate project and/or master thesis.

Demonstrate a sense of exploration that enables them to pursue rewarding careers in high-tech industries, bio-tech industries, finance, businesses, education systems, military and local and federal government

Demonstrate flexibility, transferability and adaptability of their life-learning skills that are so important in a fast changing national and international economy.

- b. Plans for assessing program goals and student learning outcomes. Some planners find it helpful to develop matrices in which student learning outcomes and required courses are mapped, indicating where content related to the learning outcomes is introduced, reinforced, and practiced at an advanced level in required courses. (**CPEC “Maintenance and Improvement of Quality”**)

- 1) Creation of the MSCS Advisory Board that will review the program annually.
- 2) Annual review of the mapping of program objectives and course syllabi.
- 3) Student evaluation of the courses.

- 4) Alumni evaluation of the program.
 - 5) Tracing career development of the alumni.
- c. Total number of units required for the major; total number of units required to graduate.

Required Courses - 32 units

COMP	599	Graduate Seminar 2	
COMP	597	Thesis	6
Electives (minimum of <u>18</u> units must be COMP)			24

Graduation Requirements

To obtain the degree, an MS Computer Science student must:

- complete 32 units of graduate coursework including:
- 24 units of graduate coursework with at least 18 units designated as "COMP"; the remaining 6 units may be "COMP" or another graduate designation; e.g., "MATH" or "PHYS"; at least 15 units must be taken while matriculated at CSUCI,
- 2 units of COMP599,
- 6 units of COMP597,

complete each course with a minimum grade of B,
defend a thesis with a passing grade ("ACCEPT") as evidenced by a formal report (the first three pages of the thesis) from the examination committee.

- d. Include a justification for any baccalaureate program that requires more than 120-semester units or 180-quarter units. **Not Applicable.**
- e. If any formal options, concentrations, or special emphases are planned under the proposed major, identify and explain fully. Optional: You may propose a CSU degree program code and CIP code for each concentration that you would like to report separately from the major program, if the option is approximately equivalent to a degree currently listed on the CSU application-booklet degree program table. If you do not find an appropriate CSU degree program code at: http://www.calstate.edu/app/documents/HEGIS-CIP2000_102406.xls , you can search CIP 2000 at <http://nces.ed.gov/pubs2002/cip2000/> to help identify the code that best matches the proposed curriculum. **Not Applicable.**
- f. A list of all courses *required* for the major, specifying catalog number, *title*, units of credit, and prerequisites or co-requisites (thereby ensuring that there are no "hidden" prerequisites that would drive the total units required to graduate beyond the total reported in 4c above).

Required Courses - 32 units

COMP	599	Graduate Seminar	2
COMP	597	Thesis	6
Electives (minimum of <u>18</u> units must be COMP)			24

- g. List of *elective* courses that can be used to satisfy requirements for the major, specifying catalog number, title, units of credit, and prerequisites or co-requisites. Include proposed catalog descriptions of all new courses. For graduate program proposals, identify whether each course is a graduate or undergraduate offering.

Electives - 24 units (all courses are graduate level offerings only)

A minimum of 18 units must be COMP

COMP	510	Algorithms	3
COMP	520	Advanced Database Systems	3
COMP	524	Security	3
COMP	529	Network Computing	3
COMP	549	Human-Computer Interaction	3

COMP	550	Advanced Software Engineering	3
COMP	566	Geometry and Computer Graphics	3
COMP	569	Artificial Intelligence	3
COMP	571	Biologically Inspired Computing	3
COMP	572	Neural Networks	3
COMP	575	Multi-agent Systems	3
COMP	578	Data Mining	3
COMP	590	Special Topics in Computer Science	3
COMP	581	Mathematical Methods in Artificial Intelligence (MATH)	3
COMP	597	Master Thesis	1-6
COMP	599	Graduate Seminar	1
MATH	510	Probabilistic Methods & Measure Theory	3
MATH	511	Functional Analysis	3
MATH	555	Actuarial Sciences	3
MATH	565	Research In Mathematics Education	3
MATH	582	Number Theory And Cryptography	3
MATH	584	Algebraic Geometry & Coding Theory	3
MATH	587	Markov Chains & Markov Processes	3
MATH	588	Stochastic Analysis	3
PHYS	510	Advanced Image Analysis Techniques	3
PHYS	546	Pattern Recognition	3

Note: With regard to Sections 4f and 4g, a proposed program should take advantage of courses already offered in other departments when subject matter would have considerable overlapping content.

- h. List of any new courses that are: (1) needed to initiate the program and (2) needed during the first two years after implementation. Only include proposed catalog descriptions for new courses. For graduate program proposals, identify whether each course is a graduate-level or undergraduate-level offering. **No new course offerings are required for the program.**
- i. Attach a proposed course-offering plan for the first three years of program implementation, indicating, where possible, likely faculty teaching assignments.

The program has been offering COMP599 Seminar and COMP597 Master Thesis courses every semester since the start. COMP597 is also offered in the summer. In addition, at least two COMP courses were offered every semester, but students could also take MATH or PHYS course. Since Fall 2009, three COMP courses are offered every semester in addition to the Seminar and Thesis. At least one course was also offered during summers.

The program publishes a tentative schedule for two subsequent years. An attempt is made to run every course in a cycle that allows every student in the program to have a chance to take that course before graduating.

All MSCS courses are taught by highly specialized faculty with doctorate degrees. Faculty from the local industry has been involved in running a number of courses.

The following is a snapshot of the tentative schedule Fall 2009 to Spring 2011:

Tentative MSCS Course Schedule
Subject to instructor availability and enrollment.

<i>Additionally, summer courses might be offered depending on the demand. Please check also Math classes schedule</i>					
Course	Fall 2009	Spring 2010	Summer 2010	Fall 2010	Spring 2011
COMP 510 Algorithms					X
COMP 520 Advanced Database Systems				X	
COMP 524 Security		X			
COMP 529 Network Computing	X				
COMP 549 Human-Computer Interaction	X				
COMP 550 Object-Oriented Software Engineering					X
COMP566 Geometry and Computer Graphics					X
COMP 569 Artificial Intelligence				X	
COMP 571 Biologically Inspired Computing					
COMP 572 Neural Networks			X		
COMP 575 Multi-Agent Systems		X			
COMP 578 Data Mining			X		
COMP/Math 581 Mathematical Methods in Artificial Intelligence	X				
PHYS 510 Advanced Image Analysis Techniques					X
PHYS 546 Pattern Recognition		X			
COMP597 Master Thesis	X	X	X	X	X
COMP 599 Graduate Seminar	X	X	X	X	X

- j. For master's degree proposals, include evidence that program requirements conform to the minimum requirements for the culminating experience, as specified in [Section 40510](#) of [Title 5 of the California Code of Regulations](#). The following describes the MSCS Thesis requirement from the University Catalog:

Master Thesis Process

A document called a **thesis** is the culmination of your graduate research. You will include the findings of your research in the thesis and defend them before a panel of three professionals with doctorate degrees. Usually, they will be university professors, but in some cases one of the members of the committee might be from outside of the academic environment. You will select a research supervisor that will be acting as a chair of the committee. The supervisor guides you throughout your research, advises on writing and decides when you are ready for the defense.

Theses defenses consist of a presentation of the results of your research that is open to the public. The second part of the defense is restricted to the members of your committee.

In a nutshell, you will need to:

- select a research topic - as soon as possible,
- select a research supervisor, who will become the chair of the committee,
- write a proposal for the thesis and submit it to the chair,
- invite two other members for the committee: one internal and one at large (internal or external).

Your research proposal needs to be accepted by the chair of the committee before you are eligible for the candidacy status.

Thesis Defense

After enrolling into COMP597 Master Thesis, you will work with your supervisor until the supervisor decides that your research and the thesis document are ready for a defense before your thesis committee. You will go through numerous revisions of your work, as not only the core research, but also the presentation of the results is important. It is expected that your work will be publishable, so your supervisor may ask you to write a summary of the work in a form of a conference or journal paper. A paper is not a required element of your thesis, however.

After your supervisor instructs you to go ahead with the distribution of the thesis, you need to distribute the drafts to all members of the committee. At this time, your supervisor should schedule the defense giving the committee approximately one month to read and analyze your thesis.

For defense, you will have to prepare roughly 1 hour presentation that will be open to public. It should consist of the following segment as applicable:

- intro
- demo if possible
- analysis of the results
- conclusions
- future
- Q&A

After the presentation, in a session closed to public, the committee will ask some questions relevant to your thesis. Next, you will be asked to leave the room, so the committee can confer behind the closed door the overall quality of your thesis. After that relatively short meeting you

will be asked to come back and the outcome will be communicated to you by the chair of the committee. The possible outcomes of the defense are:

- accept with no changes
- accept with minor changes
- accept with major changes
- reject

If your work is accepted with no changes or with minor changes, and all other requirements for the graduation have been met, then you are granted the title of Master of Science in Computer Science. A request for minor changes will be handled between you and your supervisor. If you are asked to make major changes to your work, then you will have to re-submit a revised copy of the thesis to the committee for another review. In such case, your degree will have to wait until the committee accepts the changes. If the committee rejects the thesis, you will have to take 6 units of COMP597 again, select a new research topic and a supervisor, and repeat the whole process.

Any recommended changes will have to be incorporated before your work is archived in an electronic format (PDF) in a repository at the CSUCI library. You do not need to print final copies.

k. Admission criteria, including prerequisite coursework.

Admission Process

Students seeking admission are expected to have an undergraduate degree in Computer Science or an undergraduate degree in Mathematics with an emphasis in computer science. Students with undergraduate degrees in closely related areas, such as Engineering and the Sciences, will be considered on a case-by-case basis and may be provisionally accepted. The applicant is expected to have a 2.7 or higher cumulative undergraduate grade point average (GPA). If an applicant has a GPA of at least 3.0, then no GRE is necessary. For GPAs falling below 3.0, a GRE report is needed with a score of minimum 575 in all sections (4.5 for the new analytical writing). Some applicants with lower scores in verbal reasoning and analytical writing might still be admitted to the program if English is their second language and they have strong support expressed in reference letters. Usually, three letters of reference are required. The letters need to be sent directly to the program office.

The admission process is handled by the Office of Admission and Recruitment. The candidates have to use the CSU Mentor system to apply for enrollment into the program. Please note that the Office of Admission and Recruitment does not forward applications to the program until it receives all transcripts and supporting documentation. The program director is not able to evaluate an application before receiving the file from the admission office.

Transfer of Credits

The program director may grant up to 9 credits for graduate Computer Science courses taken at CSUCI outside of the MSCS program or from another university if:

- the university is accredited,
- the student scored B or better,
- the course was taken in the last five years, and
- the student provides an official transcript.

The actual number of credits assigned by the director of the program is determined by comparing the courses taken elsewhere to equivalent courses offered by CSUCI.

1. Criteria for student continuation in the program.

Graduation

To obtain the degree, the student must complete each course with a minimum grade of B, and defend a thesis before an examination committee.

Classification Status

Conditionally Classified

To qualify for admission in conditionally classified graduate standing, a student must:

1. Hold an acceptable baccalaureate degree from an accredited institution.
2. Have attained a grade-point average (GPA) of at least 2.5 (4.0=A) in the last 60 semester units attempted
3. Have been in good standing at the last institution attended
4. Be accepted into a graduate degree curriculum on a conditional basis, subject to the requirement that any deficiencies must be remedied by additional preparation.
5. For students entering the Master of Arts in Education: Educational Leadership Program, if the student is missing one or more of the following requirements, CBEST, advanced technology or special education course.

Classified

A student who meets the minimum requirements for admission as a graduate student, as specified in the preceding paragraph, may be admitted as a fully classified graduate student pursuing an authorized degree curriculum if the appropriate program authorities determine the he or she satisfactorily meets the professional, personal, scholastic, or other standards for admission to the graduate degree curriculum, including qualifying examinations that the appropriate program authorities may prescribe. Only those applicants who show promise of success will be admitted to the graduate curricula, and only those who continue to demonstrate a satisfactory level of scholastic competence shall be eligible to proceed in such curricula.

Advancement to Candidacy

Advancement to candidacy recognizes that the student has demonstrated the ability to operate at and sustain a level of scholarly competence that is satisfactory for successful completion of the degree requirements. The student is then cleared for the final stages of the program, which, in addition to any remaining coursework, may include the thesis, project, or examination. The student may request advancement to candidacy only after a formal program of study (except a required final or 'capstone' course) has been submitted, the graduation writing requirement has been satisfied, and sufficient coursework has been completed to allow the program to make a judgment about the student's potential to complete the program.

- m. For undergraduate programs, planned provisions for articulation of the proposed major with community college programs. *Not Applicable.*
- n. If there is a [Lower-Division Transfer Pattern](#) (LDTP) for this major, indicate the relationship between the LDTP and the requirements presented in this proposal. Information on LDTP is available at: <http://www.calstate.edu/AcadAff/ldtp.shtml>. *Not Applicable.*
- o. Advising "roadmaps" that have been developed for the major. *Not Applicable.*

- p. Provision for meeting accreditation requirements, if applicable, and anticipated date of accreditation request (including the WASC Substantive Change process).

Accreditation Note:

Master's degree program proposals

If subject to accreditation, establishment of a master's degree program should be preceded by national professional accreditation of the corresponding bachelor's degree major program.

(Accreditation note finished on next page.)

Fast-track proposals

Fast-track proposals cannot be subject to specialized accreditation by an agency that is a member of the Association of Specialized and Professional Accreditors unless the proposed program is already offered as an authorized option or concentration that is accredited by an appropriate specialized accrediting agency.

The MS in Computer Science is not subject to WASC Substantive Change review. CSU Channel Islands received its initial WASC accreditation in July 2007, subsequent to the implementation of the MS in Computer Science and thereby approving this program and its other initial undergraduate and graduate degrees

6. Need for the Proposed Degree Major Program

(CPEC "Societal Need," "Number of Existing Programs in the Field," and "Advancement of the Field")

- 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.

CSUCI is the only CSU campus in Ventura County. The closest other CSU campus is 40 miles away in Northridge (CSUN) CSUN that offers Master of Computer Science program is the only CSU campus in San Fernando Valley. Other nearby CSU campuses (in greater Los Angeles Metropolis and in San Luis Obispo) are outside of a reasonable commuting area for the residents of Ventura County.

California Lutheran University, the only other four-year university in Ventura County, offers a Master in Computer Science program, but that program differs from CSUCI's dramatically, as it is not thesis-based.

University of California Santa Barbara has a selection of good engineering program including a Master in Computer Science, however UC focus is on doctorate degrees. UC Los Angeles and University of Southern California also offer Master in Computer Science programs, but as research institutions they also focus on doctorate degrees.

- b. Differences between the proposed program and programs listed in Section 5a above.

CSUCI's MSCS is thesis-based and offers a rich selection of advanced courses balancing theoretical foundations with practical skills. As such, it is similar to programs at other CSU campuses. Only one of them, CSUN, serves some of the population from Ventura County, mostly from the western parts of the county. However, the geographical location of CSUCI in the center of the populated area of the county makes it an ideal destination for local students. Many out-of-the-county students graduating from the undergraduate Computer Science program decides to continue their studies at CSUCI acknowledging the high quality of

education received here.

UC campuses and USC focus on doctorate graduate programs, while CLU focuses on professional development, therefore they cater to a different category of students.

- c. List of other curricula currently offered by the campus that are closely related to the proposed program.

MSCS is the only technical graduate program at CSUCI. The closest program is Master in Mathematics with which MSCS shares some courses.

- d. Community participation, if any, in the planning process. This may include prospective employers of graduates.

A collaboration on graduate research has been initiated with the industry. A concrete example is research on Autonomous Interoffice Delivery Robot (AIDer) conducted with Advanced Motion Control of Camarillo, CA, that led to several Master theses.

The program is reviewed periodically by Extended University Advisory Board that includes community members. There are plans to create MSCS Advisory Board.

Some MSCS courses are taught by professionals from the local industry.

Dr. Bieszczad, Program Director, was awarded the title of 2009 Faculty Leader of the Year by the CSUCI's Business and Technology Partnership.

- e. Applicable workforce demand projections and other relevant data.

According to the Federal Bureau of Labor occupational outlook for Computer Software Engineers and Computer Programmers (<http://www.bls.gov/oco/ocos303.htm#outlook>) is excellent. The bureau predicts that between 2008 and 2018 the number of jobs in this area will increase by 21%, with the increase of 32% in the "software engineers" category that commonly requires advanced degree in Computer Science.

The bureau also is very optimistic as far as the salaries of the professions in this category are concerned stating that the average earnings for software engineers with bachelor degrees was around \$90,000 in 2008. It is worth noting that professionals with advanced degrees usually earn a substantial premium over the average, and the highest earning 10% of the workers had salaries exceeding \$125,000.

- f. If the program was proposed to meet society's need for the advancement of knowledge, please specify the need and explain how the program meets that need.

The MSCS caters to both, the professionals seeking improving or acquiring new skills, and to individuals that treat a Master degree as a step towards advanced research careers. Most of the MSCS students are already employed, or employed very quickly after graduating. A few students got accepted to Pd.D. programs.

Note: Data Sources for Demonstrating Evidence of Need

APP Resources Web <http://www.calstate.edu/app/resources.shtml>

[US Department of Labor, Bureau of Labor Statistics](#)

California Labor Market Information

Labor Forecast

7. Student Demand (CPEC “Student Demand”)

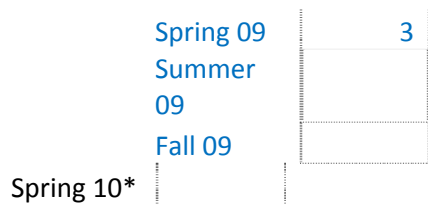
A. Compelling evidence of student interest in enrolling in the proposed program. Types of evidence vary and may include national, statewide, and professional employment forecasts and surveys; petitions; lists of related associate degree programs at feeder community colleges; reports from community college transfer centers; and enrollments from feeder baccalaureate programs, for example.

Number of majors (by year):

Fall 04	2
Spring 05	1
Summer 05	0
Fall 05	9
Spring 06	10
Summer 06	5
Fall 06	8
Spring 07	6
Summer 07	2
Fall 07	9
Spring 08	8
Summer 08	4
Fall 08	19
Spring 09	18
Summer 09	8
Fall 09	19
Spring 10	25

Number of graduates (by year):

Spring 06	
Summer 06	
Fall 06	
Spring 07	3
Summer 07	
Fall 07	
Spring 08	
Summer 08	1
Fall 08	



B. Issues of access considered when planning this program.

C. For master’s degree proposals, the number of declared undergraduate majors and the degree production over the preceding three years for the corresponding baccalaureate program, if there is one.

DESCRIPTION	FAL06	FAL07	FAL08	FAL09
Total Program FTEs	70.5	77.3	174.7	157.5
Total FTEs of Majors in Program Courses			37.3	48.7
Number of Course Sections	32	38	40	39

D. Professional uses of the proposed degree program.

E. 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.

See above (g.) for historical figures. A growth rate of 10% per year is expected.

8. Existing Support Resources for the Proposed Degree Major Program (CPEC “Total Costs of the Program”)

Note: Sections 7 and 8 should be prepared in consultation with the campus administrators responsible for faculty staffing and instructional facilities allocation and planning. A statement from the responsible administrator(s) should be attached to the proposal assuring that such consultation has taken place.

Extended University is mandated to operate self-supported programs maintained through student fees and other non-State funds. Per EO1000 and a formalized University MOU, Extended University fully reimburses the State for all expenses incurred in the operations of special session degree programs. As such, this program is estimated to have sufficient funds available through student fees to maintain and grow the program in the future (See statement from Dean of Extended University in Exhibit 2).

- a. Faculty who would teach in the program, indicating rank, appointment status, highest degree earned, date and field of highest degree, professional experience, and affiliations with other campus programs. For master’s degrees, include faculty publications or curriculum vitae.

Note: For all proposed graduate degree programs, a minimum of five full-time faculty members with the appropriate terminal degree should be on the program staff.
(Code Memo EP&R 85-20)

Dr. Andrzej Bieszczad, Associate Professor, Computer Science
Ph.D. in Electrical Engineering, Carleton University, Ottawa, Canada

Master of Computer Science, Carleton University, Ottawa, Canada
Magister Informatyki, Uniwersytet Jagiellonski, Krakow, Poland
Dr. Bieszczad brought to CSUCI multidimensional expertise from academia and industry from Poland, Canada, and USA. He was a professor at Carleton University in Ottawa, Canada, and at California State University Northridge, where he taught computer science and engineering courses. He also worked in research and development departments of several leading computer and telecommunications companies including Alcatel, Bell-Northern Research (Nortel Networks), and Bell Laboratories (Lucent). Dr. Bieszczad's career includes a stint as a Chief Technology Officer and a Vice-President of Engineering of a startup company.

Dr. Peter Smith, Professor of Computer Science

Born and raised in England, Peter Smith received his Bachelor of Arts Degree in Computer Studies from Lancaster University in 1971 and his Ph.D also in Computer Studies from Lancaster in 1975. His graduate research, supervised by Professor Bryan Higman, was in the area of optical character recognition. Dr. Smith came to Channel Islands from CSU Northridge where he was Professor of Computer Science and the faculty advisor to the student chapter of the ACM. Prior to joining the CSUN faculty in 1980 he taught in Wales (University College of Swansea) and Scotland (Strathclyde University).

Dr. William J. Wolfe, Professor, Computer Science

Ph. D. Mathematics, City University of New York, 1976
B. A. Mathematics, Queens College (CUNY), 1972

Prof. Wolfe earned a Ph. D. in Mathematics, City University of New York, 1976 and then became a commissioned officer in the United States Navy, on active duty from 1976 to 1981 (Naval Nuclear Power School, Orlando, Florida). In 1981 he joined the Artificial Intelligence group at Martin Marietta (now Lockheed-Martin) in Denver. There, he worked on computer vision and software modeling of autonomous vehicles and manipulators for projects funded primarily by DARPA, NASA and JPL. In 1988 he accepted the position of associate professor of computer science at the University of Colorado at Denver.

Dr. Geoff Dougherty, Professor of Physics

Dr. Dougherty joined CSU Channel Islands as Professor of Physics after serving ten years as Professor of Medical Imaging, and several years as Chairman of the Radiologic Sciences Department, at Kuwait University. Whilst there he planned and implemented a revised curriculum for the teaching of medical imaging. Prior to this he was the Chair of Physics and Physical Sciences at Oxford Brookes University, where he led the development and accreditation of a new double major in electronics and supervised several Ph.D. projects in biomedical instrumentation. He worked for the Open University, tutoring classes in technology and communications for mature students, and has served on the faculties of the Science University of Malaysia and the University of the South Pacific, where he developed and taught distance-learning courses in electronics and materials science.

Dr. Jorge Garcia, Assistant Professor of Mathematics

Dr. Garcia was an associate professor at National University of Mexico (UNAM) where he did his BS. Once he had an MS at Center for Advanced Studies and Research (CINVESTAV, National Polytechnic Institute) in Mexico City, he traveled to Madison Wisconsin to obtain a MA (Math, Math is considered an art at UW-Madison). At the same school, UW-Madison, Dr Garcia completed his Ph.D. dissertation on Stochastic Integrals and Large Deviations.

Dr. Ivona Grzegorzczuk, Professor of Mathematics

Dr. Ivona Grzegorzczuk received her Ph.D. from the University of California Berkeley in 1990 under the supervision of Professor Soshishi Kobayashi. Dr. Grzegorzczuk has worked at the Oregon State University, the University of Massachusetts, Warsaw University (Poland), Henri Poincare Institute (France) and the University of Liverpool (England) among others.

Dr. Cynthia J. Wyels, Professor of Mathematics

Dr. Wyels received a Ph.D. in Mathematics from U.C., Santa Barbara in 1994 under the guidance of Dr. Morris Newman. Her B.A. and M.S. degrees are also in Mathematics, from Pomona College and the University of Michigan, respectively. Prior to joining CSUCI, Dr. Wyels served as chair of Mathematics at California Lutheran University; her faculty experience also includes Weber State University and the United States Military Academy.

Dr. Richard Alex Wasniowski, Lecturer of Computer Science

University of Technology, Wroclaw, Poland 1976 PhD Computer Science
University of Technology, Wroclaw, Poland 1970 MS Computer Electronics

California State University- Dominguez Hills; Carson, CA 90747; Associate Professor (tenured); 08/2000- 08/2008; Research, Teaching and Service.

Sandia Labs; Albuquerque, NM 87111; 07/94-07/00, Researcher, Area IV and Philips Laboratory at Kirkland Air Force Base, Designing various control systems.

New Mexico Highlands University; Las Vegas, NM 87111; 12/90-06/94, Visiting Professor, Teaching Computer Science and Computer Engineering Courses.

Penn State Electronics, Philadelphia, PA, 01/90-11/90, Computer Programmer.

Wroclaw University of Technology; Wroclaw, Poland. 1977-1989, Assistant Professor.

Extended University fully reimburses the State for faculty teaching in the special session degree program. Faculty members teach either through overload within the 125% parameters or receive course buy-out at a rate set by the V.P. of Finance and Administration. In addition to tenure track staff, the program is supported by part-time faculty hired on a course-by-course contractual basis. As the program grows, additional faculty resources will be funded by student fees.

- b. Space and facilities that would be used in support of the proposed program.
Space and Facilities: Student fees provide sufficient resources through Extended University to reimburse the State for the use of appropriate classroom space. As the program grows, additional space and facilities will be funded by student fees.
- c. A report provided by the campus Library, detailing resources available to support the program (discussion of subject areas, volume counts, periodical holdings, etc. are appropriate).
Library Resources: Student fees provide sufficient resources through Extended University to reimburse the State for the use of required library resources. As the program grows, additional library resources will be funded by student fees. The library subscribes to the major databases, e-books collections, and online journals collections in the field, including Safari Tech Books online, ACM Digital Library, IEEE Publications, Wiley Interscience, and Science Direct.
- d. Existing academic technology, equipment, and other specialized materials currently available.
Academic Technology: Student fees provide sufficient resources through Extended University to reimburse the State for the use of needed academic technologies. Additionally, Extended University maintains separate resources for additional technology support. As the program grows, additional technology resources will be funded by student fees.

**9. Additional Support Resources Required
(CPEC “Total Costs of the Program”)**

As an existing university degree, no additional support resources are required for this program beyond those currently provided.

Note: If additional support resources will be needed to implement and maintain the program, a statement by the responsible administrator(s) should be attached to the proposal assuring that such resources will be provided.

- a. Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.
- b. The amount of additional lecture and/or laboratory space required to initiate and to 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.
- c. A report written in consultation with the campus librarian, indicating any additional library resources needed. Indicate the commitment of the campus either to purchase or borrow through interlibrary loan these additional resources.
- d. Additional academic technology, 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.