



## **Demands for Occupational Employment and Majors** **Subcommittee on Analysis of External Data of the Task Force on Academic Planning**

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Subcommittee on Enrollment Members:

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### **Executive Summary**

Information on national, CSU and Ventura County community college enrollments, in concert with occupational outlook information and economic forecasts are examined to determine which fields of study will best meet future demand. Areas that provide greater opportunities for large enrollment and low cost, while meeting workforce demands are Business, Education, and Psychology. Larger and moderately sized programs, with relatively low cost, are found in Communications, Criminal Justice and Social Sciences programs such as History and Sociology. Majors that meet the needs of community college students planning to transfer are Nursing, Education, the Arts, and Computer Science. Innovative and forward thinking fields of study, with community partnership potential include biotechnology, Computer Science, and Kinesiology/Nutrition/Fitness.

## Demands for Occupational Employment and Majors

As stewards of taxpayer funds, and as stewards for the values and ideas that are transmitted to the next generation of citizens, we have an obligation to think carefully about the curricular path this institution will choose. These decisions cannot be determined by personal preferences, by the specific talents of individual faculty, nor by mirroring the standard curriculum one might find at any four year institution of higher education.

There is a reciprocal relationship between curriculum and society<sup>1</sup>. The challenge is to preserve a body of knowledge valued and recognized by the expertise of the academy while still allowing the forces of innovation to mold the curriculum into a way that best serves the needs of the people whose tax dollars allow the operation of the higher education institution. Traditional curricula have outlived their usefulness if they don't prepare students for the world in which they live. Yet, societal forces influence curriculum to the point where some say disparagingly that we change curriculum to fit market pressures without concern for the canon<sup>2</sup>. The committee was mindful of these competing philosophies as it strove to balance conservation and innovation.

Overlaid on to this tension was the reality that the university's enrollment will double over the next five years, and that each curricular step must support that growth.

Thus a data sub-committee was created to investigate a variety of data areas and to use this information as one of the bases for curricular decisions. As a public and state-supported institution, the sub-committee members felt that CSUCI has the obligation to meet the needs of the state in several ways.

First, we examined the current higher education system nationally and in California to determine both: the majors that one could expect to generate large enrollment; and, for the CSU system, which programs in the CSU system were already impacted, to determine if there were ways Channel Islands might take some strain off the CSU system. (See Appendices A, B, and C).

Second, since part of CSUCI's responsibility is to accept transfer students, we examined the majors for Community College students who expect to transfer to four year colleges (See Appendix D).

Third, we examined the demand for graduates in the fastest growing occupations. To satisfy this requirement the sub-committee examined data from the Bureau of Labor

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<sup>1</sup> Bastedo, Michael. 2005 "Curriculum in Higher Education: The Historical Roots of Contemporary Issues", in *American Higher Education in the Twenty-First Century: Social, Political, and Economic Challenges*. Ed. Altbach, P.G., Berdahl, R.O., Gumpert, P.J. Johns Hopkins University Press: Baltimore

<sup>2</sup> Bok, Derek. 2003. *Universities in the Marketplace* (2003). The Commercialization of Higher Education. Princeton University Press.

Statistics, the California Employment Development Department, and local economic forecasts (See Appendices E, F, and G).

Fourth, we conducted web searches and examined several reports dealing with the economic needs of the region and specific industry and major reports. These included the Ventura County Economic Outlook report, the Biotechnology Report (See Appendix H), the Delaware National Study of Instructional Costs and Productivity, and a report prepared by a consultant specifically for CSUCI on related topics (See Appendix I).

Our findings are summarized in the attached spreadsheet: *Academic Majors Comparison*.

This table utilizes the major fields of study in the CSU system for the primary listing of possible majors.<sup>3</sup> These are listed in column one. Information on the top bar is divided into four main areas;

- **Program Enrollment:** the relative enrollment sizes nationally, within the CSU system (including impacted programs), the Ventura County Community College District (VCCCD), and the current major fields at CSUCI, majors proposed in the June 2004 recommendations to President Rush, and the Task Forces proposed majors.
- **Community Needs:** Projected national, state, and local job projections over the current decade, including potential partnership opportunities with area businesses and industries.
- **Distinctiveness:** Majors with the potential for unique, value-added opportunities for students, majors with mission-based opportunities, i.e. interdisciplinary, service learning, multicultural and international perspectives, and majors that offer growth opportunities as emphases of existing majors.
- **Fiscal Ramifications:** Estimated instructional costs and the number of current CSUCI faculty to determine areas of anticipated faculty growth.

### **Program Enrollment**

Columns 2 through 5 in the Academic Majors Comparison table provide National, state, and community college percentages by major field of study. Nationally, within the state and in the county's community college system, the largest percentage of students is found within the Business majors with approximately 20% of students enrolled in this major.<sup>4</sup>

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<sup>3</sup> Note: NCES does not provide the level of specificity in major fields that is found in the CSU data reports. Similarly, there is not a one to one correspondence between NCES and CSU listed majors and those found in the Community College, those currently at CSUCI, and proposed programs. Majors were aligned in ways that made the most sense for the particular grouping and that maximized cross comparisons.

<sup>4</sup> NCES data identifies degrees awarded in 2001-02, the most recent year for which data is available. The Fall 2004 CSU data identifies those in majors and the Fall 2004 VCCCD data identifies those in majors planning to transfer to 4 year institutions only. For comparison purposes 'undeclared' students were not considered.

The largest areas of emphasis within Business are general Business, Accounting, Marketing, and Finance.

Among students attending four-year institutions, Social Sciences has the next largest percentage of students with 10% of student nationally and 8% of students within the CSU systems declaring majors in this area. The largest sub-fields within this area are History and Sociology. Nationally, Education is the next largest major with 8.2% of students enrolled in that field of study, while the next largest percentage of students seeking degrees in the CSU system was in the field of Engineering (7.9%),

Both nationally and within the CSU system students in Psychology, Health Professions, the Arts, and Communication enroll between 5 and 6% of the undergraduate population.

In the CSU system within the Arts, Art and Music were the largest subfields; within Education, Kinesiology and Childhood studies were the largest subfields. Health professions are comprised largely of those studying Nursing, and Public Administration's largest subfield is Criminal Justice.

VCCCD enrollment shows slightly different patterns from those found nationally. After Business, the largest percentages of students planning to transfer to four year institutions are found in the Health Professions (12.8%) and in Liberal Studies (10.1%). Nursing students again comprise the bulk of those in Health Professions. As with students attending four year institutions, those in the Arts (8.8%) are most likely to be in the areas of Art and Music; the largest single group of those majoring in Education (7.6%) is found in Childhood Studies; and Social Science students are most likely to be in the subfields of Sociology and History.

National Trends. To ensure that relatively small, but emerging majors were considered in the analysis, NCES trends in degrees awarded by major field were examined.<sup>5</sup> Between 1996-97 and 2001-02, computer and information sciences grew 91%. During this same time the fields of parks, recreation, and leisure studies; visual and performing arts; communications and communications technologies; business; and philosophy and religion each increased over 20%. In contrast, between 1991-92 and 2001-02 there was a 16% decline in the field of mathematics and a 5% decline in Engineering. A synopsis of these data is found in the following Table 1.

More recent data have shown increases in two other areas. Within the past decade bioengineering and biomedical engineering programs have tripled and are expected to continue to grow as it becomes less an application of engineering and more a stand alone program.<sup>6</sup> A nationwide survey of college freshman also identified recent increases in

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<sup>5</sup> NCES. Table 252. Bachelor's degrees conferred by degree-granting institutions, by discipline division: Selected years, 1970-71 to 2001-02. <http://nces.ed.gov/programs/digest/d03/tables/dt252.asp>

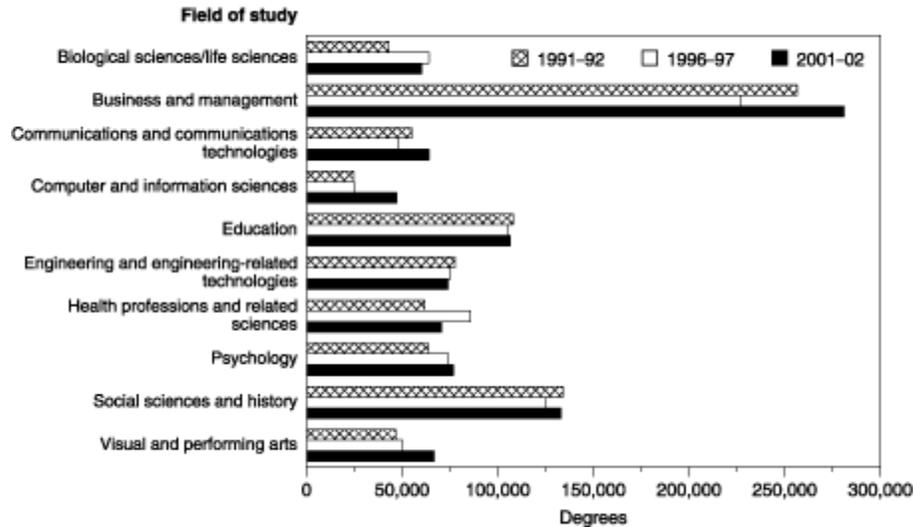
<sup>6</sup> Loftus, Margaret. "Bioengineering Has Become One Of The Fastest-Growing Majors." November 2004, v. 14, no. 3. [http://www.prism-magazine.org/nov04/tt\\_bioboom.cfm](http://www.prism-magazine.org/nov04/tt_bioboom.cfm)

student interest in particular majors.<sup>7</sup> Student increased interest in majoring in biological sciences, biochemistry and biophysics has doubled over the past decade. Interest in nursing, pharmacy, and dentistry are also at all time highs.

In addition, the number of history majors at four-year colleges continues a decade long climb with the number of majors rising 8% between 2001-02 and 2002-03, compared to a nearly 3% general increase in the number of enrolled undergraduates during the same time frame.<sup>8</sup>

Table 1.

**Figure 16. Trends in bachelor's degrees conferred by degree-granting institutions in selected fields of study: 1991-92, 1996-97, and 2001-02**



SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), "Completions" surveys, 1991-92, 1996-97, and Fall 2002.

The percentage of students enrolled in majors at CSUCI is listed in Column 6 of the Academic Majors Comparison table. The largest major is Liberal Studies (27.2%) followed by Business (20.5%) and Psychology (12.5%). Also listed in this column are the dates for beginning majors that were recommended in the June, 2004 proposal.

<sup>7</sup> HERI. The American Freshman. National Norms for Fall 2004.

[http://www.gseis.ucla.edu/heri/PDFs/04\\_Norms\\_Flyer.pdf](http://www.gseis.ucla.edu/heri/PDFs/04_Norms_Flyer.pdf)

<sup>8</sup> <http://www.historians.org/Perspectives/Issues/2004/0404/rbtstudents0404.htm>

## Community Needs

National Outlook. The Bureau of Labor Statistics provides information concerning the specific occupations that are projected to grow the fastest, along with the largest numerical increases and decreases in these occupations.<sup>9</sup> An analysis of this information is found in Appendix E. The fastest growing occupations for college graduates between 2002 and 2012 are in the areas of Computer Science and Health Sciences. Details are found in Table 2 below.

<b>Table 2. Projected Nationwide Occupational Growth Areas:</b>	<b>Percent Change: 2002-2012</b>
Network systems and data communications analysts	57%
Physician assistants	49%
Medical records and health information technicians	47%
Computer software engineers, applications	46%
Computer software engineers, systems software	46%
Physical therapist assistants	46%
Fitness trainers and aerobics instructors	45%
Database administrators	44%
Veterinary technologists and technicians	44%
Dental hygienists	43%

Source: United State Bureau of Labor Statistics

A second way to examine job growth is by looking at the occupations with the most new jobs. The BLS estimates that the most new jobs will be in the areas of Education, Accounting and Computer Science. Details are found in the table below.

The spreadsheet, Academic Majors Comparison, also lists information about expected job growth for careers requiring Masters and Doctoral degrees. The fastest growing occupations and the occupations having the largest numerical job growth for Doctoral degree recipients are in the areas of: postsecondary teachers; computer and information scientists (research); medical scientists; clinical, counseling, and school psychologist; and biochemists and biophysicists.

<sup>9</sup> BLS: Fastest growing occupations, 2002-2012. <http://www.bls.gov/emp/emptab3.htm> and <http://www.bls.gov/oco/ocotjt1.htm>.

<b>Table 3. Projected Most New Jobs Nationwide:</b>	<b>Numerical Change: 2002-2012</b>
Elementary school teachers, except special education	223,000
Accountants and auditors	205,000
Computer systems analysts	184,000
Secondary school teachers, except special & vocational education	180,000
Computer software engineers, applications	179,000
Special education teachers	130,000
Computer software engineers, systems software	128,000
Network systems and data communications analysts	106,000
Network and computer systems administrators	94,000
Computer programmers	73,000

Source: United State Bureau of Labor Statistics

The fastest growing occupations for Master's degree recipients are in the areas of: physical therapists; mental health and substance abuse social workers; rehabilitation counselors; survey researchers, and epidemiologists. In addition large job growth is also predicted for educational, vocational and school counselors, and for market research analysts.

State and County Outlook. The State of California Employment Development Department offers employment projections statewide and for specific counties.<sup>10</sup> Appendix F provides specific information about the statewide occupational projections between 2002 and 2012. Statewide, the fastest percentage growth for bachelor degree prepared students will be found in the areas of Computer Science, fitness and health, financial advising and education. A synopsis of this is listed in Table 4.

For Masters and doctoral prepared students the fastest growing jobs will be in the areas of postsecondary Art, Drama and Music teachers (44.3%), English Language and Literature teachers (41.5%), Physical Therapists (42.9%) and Medical Scientists (34.7%).

Table 5 identifies the most new jobs projected statewide. The largest growth for jobs requiring a bachelor's degree is expected to take place in the areas of management, education, Computer Science, and accounting. Additionally an expected 56,800 new jobs will be created for nurses with an Associates degree and 13,400 new jobs will be created for those with a law degree. A synopsis of the bachelor's degree created jobs is found in Table 5.

<sup>10</sup> <http://www.calmis.ca.gov/htmlfile/subject/ocproj.htm>

<b>Table 4. Projected Statewide Occupational Growth Areas:</b>	<b>Percent Change: 2002-2012</b>
Network systems and data communications analysts	55.7%
Fitness Trainers and Aerobics Instructors	48.8%
Computer Software Engineers	43%
Database Administrators	42.9%
Occupational Therapist	41%
Personal Financial Advisors	40.7%
Computer software Engineers	37.7%
Network system Administrators	37%
Special Education Teachers, Middle School	35.7%
Computer and information Systems Managers	35.3%
Computer systems analyst	33.7%
Management Analysts	34.4%
Special Education Teachers, Preschool, Kindergarten, Elementary	31.7%
Kindergarten teachers	30.6%

<b>Table 5. Projected Most New Jobs Statewide:</b>	<b>Numerical Change: 2002-2012</b>
General and Operations Managers	42,900
Elementary School teachers, except special education	31,300
Computer software engineers, applications	29,800
Secondary school teachers, except special/vocational education	25,200
Computer software engineers, systems software	22,400
Accountants and auditors	21,600
Management analysts	18,300
Computer systems analysts	17,800
Sales Managers	14,000

Ventura County labor market information is similar to that nationally and statewide.<sup>11</sup> The largest expected growth can be found in the areas of business and finance (General and Operations managers, accountants, securities, commodities and financial service sales agents, financial managers, financial analysts, marketing managers); education (teachers in elementary and secondary education, special education teachers in secondary school, educational vocational and school counselors); Computer Science (computer software engineers, network and computer systems administrators), and for mental and public health social workers, and editors. Appendix G. lists detailed information about the occupations with the largest percentage and numerical growth.

The committee considered additional information on labor market projections, including the UCSB Economic Forecast Project information for the areas of Ventura County and for the city of Camarillo.<sup>12</sup> This report identifies a strong economic climate with services, durable goods, and finance/insurance/real estate as the largest industries. It suggests a “graying” of the coastal population, with older and wealthier consumers interested in spending their inheritance on travel, recreation, exercise, and other wellness activities.

The committee also reviewed a consultant report on academic planning for CSUCI based on local and regional occupational projections (see Appendix I)<sup>13</sup>. This report recommends that occupational projections be considered as one important component of determining curriculum, but that other criteria should be considered that will allow for a diverse and well-rounded general education, as well as programs that will make the university unique. The report also critiques the June 2004 Curriculum Plan noting the overall need for bachelor’s trained workers in the areas of business (management and financial), computer and mathematical science, and education and other training, and questioning the job opportunities for more specialty majors, such as Gender Studies.

Community Partnership Opportunity. The committee felt it was important to recognize ways in which the university might be able to partner with area industry and community organizations in the development of its curriculum. Curricular partnerships can leverage and maximize resources, provide a venue for civic engagement and service learning opportunities with the community, and ensure that conversations about local workforce needs are addressed. Column 9 of the Academic Majors Comparison Spreadsheet identifies local business and groups that the committee felt might be potential partners for specific majors. They include area businesses, such as Amgen, Baxter, and Dole, county elementary and secondary schools, county government, and local performance groups and venues.

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<sup>11</sup> Employment Development Department: Ventura County.  
<http://www.calmis.cahwnet.gov/FIL/OCCPROJ/ventuF&F.htm>

<sup>12</sup> Ventura County - [http://www.ucsb-efp.com/ppt/2005/VA\\_Watkins.ppt](http://www.ucsb-efp.com/ppt/2005/VA_Watkins.ppt) , Camarillo - [http://www.ucsb-efp.com/ppt/2005/CAM\\_Watkins.ppt](http://www.ucsb-efp.com/ppt/2005/CAM_Watkins.ppt)

<sup>13</sup> Jewett, Frank. “Academic Program Planning and Local Region Occupational Projections.” January 2005.

## **Distinctive**

The committee felt it was important to recognize which majors provided an opportunity to fulfill the mission through interdisciplinary coursework, service learning, multiculturalism or international outlook. These are noted in column 10, as are majors that could begin as an emphasis within a currently existing major.

## **Fiscal Ramifications**

The creation of each major should be considered with an understanding of the resources necessary to successfully create a quality program. The average instructional cost per student is listed in column 11<sup>14</sup>. Engineering and Nursing are among the most expensive programs to operate, along with other lab based classes such as those in Art, life Sciences and Physical Sciences. Sociology, Psychology, Geography, and other lecture based courses are the least expensive to operate. The number of CSUCI faculty is listed in column 12, with tenured and tenure track faculty listed first and Lecturers listed second. This information provided the committee the opportunity to consider the “supply” of existing faculty when considering future majors and what areas may need additional hires based on curricular recommendations.

## **Conclusion**

Large Enrollments. Major fields of study that provide the best opportunities for large enrollment and low cost, while meeting workforce demands, are in the majors of Business, Education, and Psychology. Business is the largest single major nationally, and positions in management, marketing, finance and accounting are expected to increase between 17% and 35% through 2012. Education is expected to have large increases in job openings at all levels, but particularly in the areas of Special Education, where it is expected to grow by 74% through 2012. The need for preschool and childcare workers is expected to increase by over 30%. Students who major in Psychology and choose post baccalaureate studies will find demand for educational and school counselors (20%) and for clinical psychologists (21% – 35%).

Larger and moderately sized programs, with relatively low cost, are found in Communications, Criminal Justice, and Social Sciences areas such as History and Sociology. These majors also lend themselves to interdisciplinary approaches and can serve as incubators for growing additional majors.

Community College Transfer Needs. Majors that meet the needs of community college students planning to transfer are Nursing, Education, the Arts, and Computer Science. The largest percentage of community college students is interested in these majors. Occupational demand for Nursing, Education and Computer Science related positions is

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<sup>14</sup> National Study of Instructional Costs and Productivity <http://www.udel.edu/IR/cost/>

also very high. Partnerships with local school districts and area hospitals also make Education and Nursing attractive majors.

Innovative Programs. Innovative and forward thinking fields of study, with community partnership potential include biotechnology, Computer Science, and Wellness (Kinesiology/Nutrition/Fitness).

Biological Sciences is a mid-size program with 4.8% of CSU enrollment. While only .4% of CSU students majored in biotechnology as of Fall 2004, student demand is increasing in this area. Additionally, this is a field with large anticipated job growth and the opportunity for partnerships with area businesses.

Majors in Computer Science have nearly doubled in the past decade and are expected to grow another 40% to 50% through 2012. As information technology becomes a larger part of our everyday world, the interdisciplinary opportunities for this major include art, mathematics, educational instruction, and communications among others.

An emerging field of study is in the area of Wellness. The aging of the population and awareness of the importance of finding ways to maintain one's health as one ages lends itself to an interdisciplinary grouping of Kinesiology, Nutrition, and Fitness/Recreation. Jobs for Recreation and Fitness workers, physical therapists, and care facilities for the elderly are all expected to increase between 21% and 37%. The new local Wellness Center, as well as area spas and organic farms provide opportunities for community partnerships.

### **Recommendation**

The subcommittee recommends that as part of the on-going conversation about academic planning, future committees should include a planning matrix to determine whether or not a particular field of study, either as a major or a minor, should be placed on the curriculum. Items for consideration should include: program size, program cost, expected workforce demand, compatibility with and augmentation of the mission, and community partnership opportunities.

## Appendix A

NCES Table 265. Bachelor's degrees conferred by degree-granting institutions, by sex, racial/ethnic group, and major field of study: 2001-2002

SOURCE: <http://nces.ed.gov/programs/digest/d03/tables/dt265.asp>

## **Appendix B**

CSU Undergraduate Degrees Granted by Major in 2002-03

SOURCE: [http://www.calstate.edu/AS/stat\\_reports/2002-2003/deg05.htm](http://www.calstate.edu/AS/stat_reports/2002-2003/deg05.htm)

## Appendix C

Impacted CSU majors

SOURCE: [http://www.calstate.edu/AR/CSUIP\\_Grid2005\\_2006.xls](http://www.calstate.edu/AR/CSUIP_Grid2005_2006.xls)

## **Appendix D**

Ventura County Community College District Majors for Students planning to Transfer to  
4 Yr. Schools

SOURCE: Enrollment Code 2004 07 from private VCCCD report

## Appendix E

“Occupational employment projections to 2012” by Daniel E. Hecker in Monthly Labor Review, February 2004

SOURCE: <http://www.bls.gov/pub/mlr/2004/02/art1full.pdf>

## **Appendix F**

### **California Occupational Projections 2002 – 2012**

SOURCE: [http://www.calmis.ca.gov/FILE/OCCPROJ/cal\\$OccProj.xls](http://www.calmis.ca.gov/FILE/OCCPROJ/cal$OccProj.xls)

## Appendix G

Employment Development Department: Ventura County.

SOURCE: <http://www.calmis.cahwnet.gov/FILE/OCCPROJ/ventuF&G.htm>  
<http://www.calmis.cahwnet.gov/FILE/OCCPROJ/ventuo&d.htm>

## Appendix H

Under the Microscope: Biotechnology Jobs in California

SOURCE: <http://www.calmis.cahwnet.gov/file/occmisc/Biotech-Part1.pdf>

## **Appendix I**

Academic Program Planning and Local Region Occupational Projections

SOURCE: Report prepared for CSUCI by Frank Jewett, January 2005