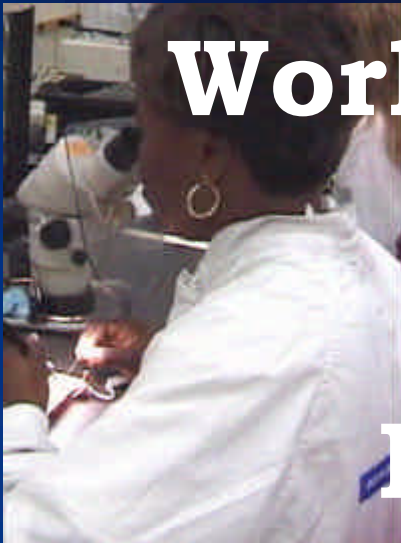




# Connecticut Workforce Demands



## and the Implications for Education



Connecticut  
Department of Labor

# Connecticut Workforce Demands and the Implications for Education

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*Labor Market Information*

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## Introduction

This report grew out of discussions between the Department of Higher Education, the Office for Workforce Competitiveness, and the Department of Labor concerning how the knowledge and skill needs of Connecticut's businesses can be met in order to support the innovation that will sustain our economy into the future. It briefly describes the major economic trends in the state of Connecticut in relationship to their effect upon employment over the next 10 years. As Connecticut's economy continues to grow in the direction of a "knowledge economy," i.e., an economy in which knowledge possessed by workers becomes the most valuable economic commodity, the investment in Connecticut's educational infrastructure becomes correspondingly more important. This report will identify some of the areas in which to concentrate that investment to assure the most effective expenditure of public monies.

The economic trends discussed here are derived from past experience and assume that the past is a guide to the immediate future. In view of the extraordinary rapidity of large-scale change in technology and the economy in recent years, these trends may not be as secure a guide as researchers and planners could have expected even a few years ago. The principal illustration of



this point is, of course, the Internet. Its central importance to all kinds of economic activity now is simply taken for granted, so much so that its corollary, the ever-continuing dramatic expansion of all kinds of dot.com enterprises had become, just prior to their collapse, an article of common economic faith. There may well be other technological marvels about to emerge with large economic and social results. These realities suggest that one essential strategy of public educational investment must be to avoid defining the scope of that investment according to any single expected economic outcome. Education should prepare students to take advantage of opportunity, but not presume to define the scope of that opportunity too narrowly. It is clear, however, that advanced educational preparation is more and more essential for economic success.

These considerations suggest that among the more important kinds of skills education might foster to best assist its recipients and their employers towards economic success are those associated with literacy, including mathematical literacy, to understand both written and oral communication and instruction. Along with these are the "soft" skills, the ability to communicate effectively in the workplace and cooperate productively with others in work groups. Desirable, too, is a readiness to reach out to new technologies and use them and other associated capabilities. That does not mean, however, that education can neglect the important skills that any new advances are likely to require. For a growing number of Connecticut jobs, people will need advanced degrees and part of the preparation for those degrees will necessarily involve good understanding of mathematics and of physical and life sciences.

## Trends in Connecticut – Population, Workforce, Industries, Occupations

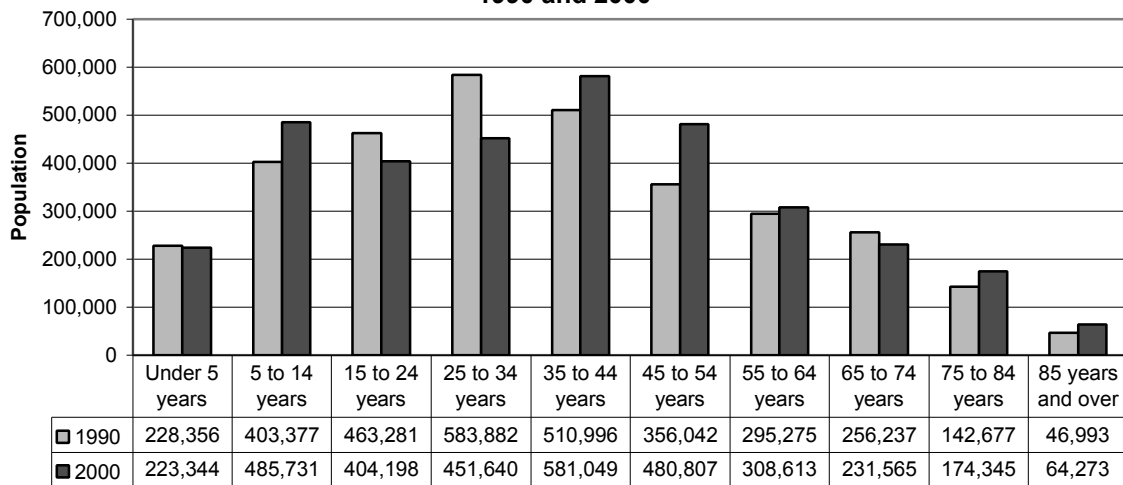
Connecticut, along with other states in the Northeast, has not had strong population or employment growth in comparison with states in the south and southwest. While the population of the country as a whole increased 13 percent from 1990 to 2000, that of Connecticut rose by only 4 percent. Its demographics, moreover, portray an aging population and a lack of younger workers able to take the place of older workers as they retire. This means, too, that the pool of potential workers available



to companies wishing to expand in the state is limited. Educational trends, on the other hand, are encouraging. Increasing numbers of students are going to college, and a majority of Connecticut college-bound youth is now enrolling in Connecticut schools.

The demographics of the State provide a rough indication of labor force availability. The experience of Connecticut in the late 1990's was of an economy of very high levels of employment and corresponding lack of available workers. Openings were plentiful and many persons entered the labor market who had not previously done so or who had difficulty of one kind or another. That situation came to an end at the onset of the current recession. Jobs today are in short supply and expectations of improvement continue to be pushed into the future. The relative distribution of persons by age in the Connecticut population suggests that a slow growth economy is the kind the State can best support. Whether a more rapid expansion can occur will depend to a great deal upon the kinds of jobs available and the ability of job seekers of all ages to obtain adequate vocational preparation.

**Connecticut Population by Age Group  
1990 and 2000**



Several features stand out in the above chart. The first is the absolute decline in the population aged 15 to 34 between 1990 and 2000. This, of course, reflects the passing of the baby boomer generation up the age ladder. In 2000 as a result, the

population groups from 35 to 54 are sharply larger. In 2010, then, those cohorts will move still further along, so that those persons aged 45 to 64 will be the larger groups while the much smaller groups will be aged 25 to 44. In the face of those numbers, it is difficult to imagine how the labor force will expand to accommodate the number of openings expected to occur without reaching into the ranks of those who are presently underused or attracting new workers to the State. The age groups following the declining numbers will again increase and schools have already had to begin again to expand, creating shortages of teachers, particularly as an aging teacher population begins to retire. This issue is already a problem at the college level and may be expected to worsen over the next few years. The State needs not only highly educated workers, but also highly educated teachers to create them.

A large shift in the nature of employment by industry has already occurred in Connecticut and continues to develop. The most pronounced change is from an economy with a large manufacturing base to one in which services constitute the largest single sector. This has meant that well-paying employment requiring minimal training typical of older manufacturing industries has disappeared. On the other hand, Connecticut hosts a number of new industries devoted to products that have only recently emerged. Biotechnology companies, for instance, form a large and growing sector and depend, as do other innovative industries, upon advances made in all kinds of basic technology and manufacturing. Even as manufacturing employment has declined in Connecticut, its products have increased in value and become items for a larger and larger export trade. In general, Connecticut industry has become much more diverse, much less reliant upon large firms and particular industries, and much more affiliated with a global economy.

These changes have resulted in an occupational structure that increasingly requires higher levels of education and offers compensation accordingly. The manufacturing that remains increasingly relies upon very sophisticated machinery and techniques requiring varying degrees of education coupled with on-the-job and employer sponsored training. Its activities take place in extremely clean environments and require high levels of worker cooperation and understanding of overall production goals. Throughout the economy, the administrative infrastructure now depends upon computer technology in the hands of persons able to extend and apply their knowledge of the systems independently with resulting gains in productivity, customer service, and economies of integration.



As the old manufacturing economy with high paying, minimal training jobs has gone, city neighborhoods have suffered as plants have closed and jobs have disappeared. At the same time, services work requiring minimal training and paying at a minimal level has expanded. Many of these jobs, however, do not occur in locations where city residents have easy access to them. Public transportation is limited and people marginally in the labor force cannot afford the investment in a car.

Economic trends in Connecticut favor most rapid growth in the most remunerative occupations. Although lower paying occupations requiring the least training will generally grow most in absolute numbers, those occupations requiring advanced educational preparation will grow most rapidly. Moreover, the occupations requiring BA degrees and more advanced and specialized training are concentrated in the high tech oriented industries, including, especially, computer-related occupations. Computer support specialists are expected to grow the most rapidly of all occupations while the next six rapid growth occupations are also computer related. These occupations are in the industries that most foster innovation and support growth and thus have a broad economic effect. Workers in these fields, of course, also support economic activity through spending their wages locally. However, the nature of their work leads to innovation and higher productivity in other industries and their supporting infrastructures. The office environment in which administrative activities occur has been vastly modified in the past decade through the application of computer technology, and software development continues to create new opportunities for efficiency and economy.



As advances occur in computing and manufacturing, particularly in the utilization of extremely small-scale techniques, unforeseen technologies and applications emerge. Biotechnological processes using microchip technology, for instance, can have uses in medical diagnostics, research, pharmacology, and security applications. Nanotechnology, a relatively new word and field of endeavor, has an immense potential for growth. Connecticut is very well situated to take

advantage of the new technologies. Its growing industrial diversity encourages even more diversity as individuals discover needs for specific kinds of activities to support different kinds of enterprise. Its location between and near large urban centers encompassing varieties of economic and intellectual endeavor creates a high awareness of innovation and its potential. The area has extraordinary research and intellectual facilities so that people can find support and understanding and reach the human capital that new enterprise requires.

Because of the rapidity with which innovation occurs and finds immediate application and use, current industrial and occupational trends may find themselves supplanted by entirely unanticipated realities. The issue is how best to direct limited public resources to educational activities that will support continued economic growth, providing a labor force able to take advantage of the opportunities that will emerge and assuring fullest use at the highest level of all the State's human resources. In view of the demographic constrictions that Connecticut possesses, expansion of educational opportunities to reach those persons, particularly in the cities, who presently cannot take advantage of them will be critical to overall prosperity.

Supportive services ranging from transportation access to child care become increasingly important.

### What the Labor Market Will Require of Successful Participants

The Connecticut Department of Labor provides a forecast of occupations needed to meet industry needs in the State from a variety of perspectives. For example, a review of the occupations that will have the most annual openings gives a high level sense of what personnel requirements might be.

The total employment for 2000 and the projected employment for 2005 and 2010 is given by the following, broken down by broad industry groups:

	Employment for the Years		
	2000	2005	2010
<b>Total, All Industries</b>	1,776,080	1,847,600	1,928,460
<b>Agriculture, Forestry, and Fishing</b>	17,720	19,640	21,560
<b>Construction and Mining</b>	66,120	69,420	72,300
<b>Manufacturing</b>	262,360	254,900	251,600
<b>Transportation, Communication, Utilities</b>	79,670	83,330	86,330
<b>Wholesale Trade</b>	83,020	85,730	88,560
<b>Retail Trade</b>	282,430	293,130	303,460
<b>Finance, Insurance, Real Estate</b>	141,260	146,100	152,270
<b>Services*</b>	735,140	785,750	840,520
<b>Government**</b>	108,360	109,600	111,860

\* Employment in state and local hospitals and educational institutions, as well as self-employed, are included in the Services sector.

\*\* Government employment figures include the U.S. Postal Service.

The table above points to overall modest growth in employment, more than 152,000 positions, about 8.6% through 2010. The largest single area of growth occurs in the services category - more than 105,000 positions - while manufacturing, in total, continues to decline, losing 10,760 positions. These trends would suggest a very modest growth potential for the state and, in particular, relatively slow income growth. However, to see what these broad industry figures mean in terms of actual economic impact and implications for education, the various occupational categories within the industries need to be examined. The following graph from the July 2003 **Connecticut Economic Digest**<sup>1</sup> illustrates growth and relative occupational size by major occupational categories over the last fifteen years.

<sup>1</sup> "Profiles of the Connecticut Workforce," Vol. 8, No. 7, p.1.





The largest growth has been in the professional category. The graph also shows, because of the current recession, a slight decrease in the numbers of service workers, as well as managerial workers, over the five years. But professional and managerial workers accounted for 31 percent of the total workforce in 2000, and are expected to grow to 33 percent in 2010, with a rather greater economic impact than any other category and a correspondingly greater need for advanced education.

The occupations with the greatest educational requirements generally have, of course, a very great economic impact. In the table below, the Net Growth is the overall expected change over the 10 year period while the Annual Openings is the average number of positions expected to be vacant each year due to anticipated growth in jobs and worker replacement needs.



Occupations Requiring BA Degree or Higher - Most in Demand by Degree					
Job Title	2000 Empl.	2010 Empl.	Net Growth	Annual Openings	Average Annual Salary
<b>First Professional Degree</b>					
Pharmacists	2,610	3,110	500	128	\$77,568
Lawyers	10,840	11,230	400	112	\$100,633
Dentists, General	3,090	3,120	30	73	\$108,700
Family and General Practitioners	2,130	2,500	370	69	\$118,787
Health Diagnosing and Treating Practitioners, All Other	2,150	2,310	160	63	\$102,490
<b>Doctoral Degree</b>					
Postsecondary Teachers, All Other	4,960	5,790	840	219	\$56,720
Medical Scientists, Except Epidemiologists	1,550	2,130	580	93	\$83,869
Biochemists and Biophysicists	1,380	1,810	430	93	\$70,231
Arts, Communications, and Humanities Teachers, Postsec.	1,890	2,010	130	67	N/A
Microbiologists	880	1,140	260	58	N/A
<b>Master's Degree</b>					
Physical Therapists	2,510	3,150	640	127	\$64,102
Educational, Vocational, and School Counselors	2,980	3,520	540	115	\$51,326
Rehabilitation Counselors	3,490	3,830	340	106	\$35,628
Clinical, Counseling, and School Psychologists	2,560	2,810	250	85	\$56,857
Mental Health and Substance Abuse Social Workers	1,780	2,300	520	72	\$46,699
Speech-Language Pathologists	1,380	1,750	370	72	\$59,931
<b>Work Experience plus Bachelor's or Higher Degree</b>					
General and Operations Managers	24,120	25,860	1,740	580	\$99,844
Financial Managers	10,260	11,430	1,170	274	\$92,737
Computer and Information Systems Managers	4,640	6,240	1,600	239	\$98,611
Management Analysts	8,520	9,650	1,130	188	\$74,515
Sales Managers	4,770	5,840	1,070	176	\$94,654
Chief Executives	4,320	4,660	340	170	\$127,555
Medical and Health Services Managers	3,410	4,100	690	128	\$79,332
Marketing Managers	3,370	4,140	780	126	\$96,218
Administrative Services Managers	3,380	3,710	330	88	\$71,884
Education Administrators, Elementary and Secondary School	2,690	2,780	80	78	\$89,516
Human Resources Managers	3,190	3,310	120	67	\$79,871
Education Administrators, Postsecondary	1,910	2,020	110	61	\$75,541
Advertising and Promotions Managers	1,500	1,840	330	55	\$79,177
Engineering Managers	3,270	3,220	-50	53	\$95,783
<b>Bachelor's Degree</b>					
Secondary School Teachers, Exc. Special & Vocational Educ.	12,520	13,310	790	460	\$55,852
Accountants and Auditors	17,910	19,730	1,830	448	\$61,110
Elementary School Teachers, Except Special Education	16,560	16,760	200	430	\$54,249
Computer Software Engineers, Applications	6,720	10,560	3,850	429	\$76,431
Computer Systems Analysts	8,970	12,300	3,330	412	\$66,923
Business Operations Specialists, All Other	10,620	12,010	1,380	408	\$55,620
Computer Programmers	10,220	10,380	150	230	\$68,100
Securities, Commodities, and Financial Services Sales Agents	5,850	7,660	1,810	228	\$94,952
Network and Computer Systems Administrators	3,460	5,450	2,000	214	\$64,011
Middle School Teachers, Except Special and Vocational Educ.	8,350	8,440	90	199	\$53,335

Occupations Requiring BA Degree or Higher - Most in Demand by Degree					
Job Title	2000 Empl.	2010 Empl.	Net Growth	Annual Openings	Average Annual Salary
Recreation Workers	5,650	6,420	770	194	\$23,421
Insurance Sales Agents	7,570	7,210	-360	193	\$60,580
Mechanical Engineers	5,290	5,530	240	179	\$64,021
Computer Software Engineers, Systems Software	2,430	3,920	1,490	166	\$69,927
Financial Analysts	5,150	6,080	930	163	\$74,712
Aerospace Engineers	3,080	3,590	510	134	\$73,813
Network Systems and Data Communications Analysts	2,290	3,440	1,160	125	\$63,290
Preschool Teachers, Except Special Education	7,040	7,390	360	123	\$51,732
Personal Financial Advisors	2,230	3,150	920	118	\$85,372
Teachers, Primary, Secondary, and Adult, All Other	5,450	6,040	600	114	\$41,097
Child, Family, and School Social Workers	4,450	5,090	640	114	\$48,028
Public Relations Specialists	2,560	3,200	650	108	\$49,845
Database Administrators	1,930	2,910	980	106	\$63,250
Editors	2,130	2,470	340	103	\$52,676
Social and Community Service Managers	3,350	3,710	360	99	\$54,200

Those occupations at the highest level – the professional degree – include those requiring specialized degrees in medicine, law and pharmacy. More than half of the annual openings in each category will be available due to replacement needs and the rest to growth. A large proportion of postsecondary teacher annual requirements



will be due to growth, reflecting the expanding school population. While their numbers are not large in a workforce of more than 1.7 million persons, their impact goes beyond their numbers. Postsecondary teachers train those persons who will be doing research and creating new products in many areas of the economy.

The economic impact of all the occupations listed in the above table is very large. In 2000 these occupations gave employment to nearly 275,000 individuals. These figures testify to the significance of higher education in the economy as well as its support of occupational diversity. These are the more significant of the highly educated occupations numerically and their variety is striking, extending from aerospace engineers through various financial specialties to human service categories and the large numbers of computer related positions.

Considering only those occupations with expected annual openings of more than 250 positions and requiring college preparation at least at the Associate Degree level illustrates in another way the immense importance of the professional and managerial worker:

Occupations Requiring an Associate Degree or Higher – with 250+ Annual Openings							
JOB TITLE	2000 Empl.	2010 Empl.	Net Change	Percent Change	Total Annual Openings	Avg. Ann. Salary	Ed./ Trng. Code <sup>2</sup>
<b>Registered Nurses</b>	30,560	36,740	6,180	20.2%	<b>1,235</b>	\$53,934	6
<b>General and Operations Managers</b>	24,120	25,860	1,740	7.2%	<b>580</b>	\$99,844	4
<b>Computer Support Specialists</b>	7,720	12,980	5,260	68.1%	<b>558</b>	\$45,796	6
<b>Secondary School Teachers, Except Special and Vocational Education</b>	12,520	13,310	790	6.3%	<b>460</b>	\$55,852	5
<b>Accountants and Auditors</b>	17,910	19,730	1,830	10.2%	<b>448</b>	\$61,110	5
<b>Elementary School Teachers, Except Special Educ.</b>	16,560	16,760	200	1.2%	<b>430</b>	\$54,249	5
<b>Computer Software Engineers, Applications</b>	6,720	10,560	3,850	57.3%	<b>429</b>	\$76,431	5
<b>Computer Systems Analysts</b>	8,970	12,300	3,330	37.1%	<b>412</b>	\$66,923	5
<b>Business Operations Specialists, All Other</b>	10,620	12,010	1,380	13.0%	<b>408</b>	\$55,620	5
<b>Financial Managers</b>	10,260	11,430	1,170	11.4%	<b>274</b>	\$92,737	4

In 2000, these few occupations comprised more than 145,000 positions whose incumbents received more than \$9.5 billion in wages. In 2010, the total positions are expected to be more than 171,000 with annual openings over the next several years averaging more than 5,000.



Another view of occupational developments with impact upon higher education involves consideration of the fastest growing occupations requiring at least some postsecondary vocational training. These growth occupations occur especially in the technologically advanced industries.

Fastest Growing Occupations Requiring Postsecondary Education or Training							
JOB TITLE	2000 Empl.	2010 Empl.	Net Change	Percent Change	Total Annual Openings	Avg. Ann. Salary	Ed./ Trng. Code <sup>2</sup>
<b>Veterinarians</b>	850	1,050	200	<b>23.1%</b>	35	\$73,681	1
<b>Microbiologists</b>	880	1,140	260	<b>29.8%</b>	58	N/A	2
<b>Biochemists and Biophysicists</b>	1,380	1,810	430	<b>31.0%</b>	93	\$70,231	2
<b>Medical Scientists, Except Epidemiologists</b>	1,550	2,130	580	<b>37.3%</b>	93	\$83,869	2
<b>Physical Therapists</b>	2,510	3,150	640	<b>25.5%</b>	127	\$64,102	3
<b>Speech-Language Pathologists</b>	1,380	1,750	370	<b>26.9%</b>	72	\$59,931	3
<b>Mental Health and Substance Abuse Social Workers</b>	1,780	2,300	520	<b>29.4%</b>	72	\$46,699	3

<sup>2</sup> Key: 1 - First professional degree, 2 - Doctoral degree, 3 - Master's degree, 4 - Work experience plus bachelor's or higher degree, 5 - Bachelor's degree, 6 - Associate degree, 7 - Postsecondary vocational training

Fastest Growing Occupations Requiring Postsecondary Education or Training							
JOB TITLE	2000 Empl.	2010 Empl.	Net Change	Percent Change	Total Annual Openings	Avg. Ann. Salary	Ed./ Trng. Code <sup>2</sup>
Substance Abuse and Behavioral Disorder Counselors	940	1,230	290	30.4%	48	\$36,724	3
Advertising and Promotions Managers	1,500	1,840	330	22.3%	55	\$79,177	4
Sales Managers	4,770	5,840	1,070	22.4%	176	\$94,654	4
Marketing Managers	3,370	4,140	780	23.0%	126	\$96,218	4
Public Relations Managers	1,060	1,320	260	24.2%	42	\$76,805	4
Computer and Information Systems Managers	4,640	6,240	1,600	34.6%	239	\$98,611	4
Public Relations Specialists	2,560	3,200	650	25.3%	108	\$49,845	5
Occupational Therapists	1,290	1,620	340	26.1%	66	\$59,191	5
Medical and Public Health Social Workers	2,170	2,800	630	28.9%	87	\$44,324	5
Securities, Commodities, and Financial Services Sales Agents	5,850	7,660	1,810	30.9%	228	\$94,952	5
Computer Systems Analysts	8,970	12,300	3,330	37.1%	412	\$66,923	5
Personal Financial Advisors	2,230	3,150	920	41.3%	118	\$85,372	5
Physician Assistants	800	1,140	340	42.1%	51	\$68,506	5
Network Systems and Data Communications Analysts	2,290	3,440	1,160	50.5%	125	\$63,290	5
Database Administrators	1,930	2,910	980	51.0%	106	\$63,250	5
Computer Software Engineers, Applications	6,720	10,560	3,850	57.3%	429	\$76,431	5
Network and Computer Systems Administrators	3,460	5,450	2,000	57.8%	214	\$64,011	5
Computer Software Engineers, Systems Software	2,430	3,920	1,490	61.4%	166	\$69,927	5
Veterinary Technologists and Technicians	980	1,190	220	22.0%	47	\$27,916	6
Dental Hygienists	2,990	3,700	700	23.5%	114	\$58,389	6
Respiratory Therapists	1,030	1,320	290	27.7%	55	\$46,364	6
Radiation Therapists	820	1,050	230	28.1%	40	\$42,599	6
Medical Records and Health Information Technicians	1,170	1,590	420	36.0%	68	\$32,513	6
Computer Support Specialists	7,720	12,980	5,260	68.1%	558	\$45,796	6
Medical Transcriptionists	860	1,060	200	23.7%	43	\$33,443	7
Manicurists and Pedicurists	1,310	1,640	330	25.1%	65	\$21,797	7
Gaming Supervisors	810	1,060	250	30.7%	48	\$42,420	7
Gaming Dealers	2,700	3,680	980	36.5%	191	\$17,710	7
Computer Specialists, All Other	2,040	3,030	990	48.8%	117	\$63,250	7

In 2000, these occupations listed above accounted for a total of 89,740 positions at an average salary of more than \$60,000 and a total payroll in excess of \$5.9 billion. If the projected employment for 2010 materializes, these occupations will employ more than 120,000 persons with a payroll of more than \$8.1 billion, an increase of more than \$2 billion. In this list of 36 occupations, one of every four is in the field of information technology, yet this is only a partial accounting of IT positions. If projections hold true, that field alone will generate about \$2 billion in additional pay.

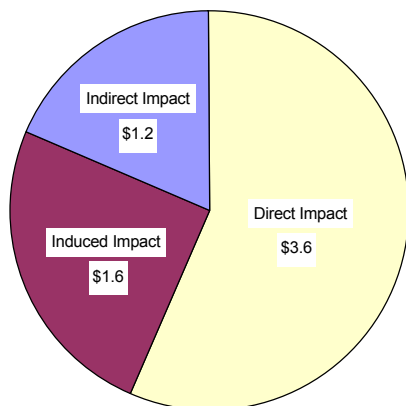
Information technology has a large impact more generally as the **Connecticut Economic Digest** of May 2003 suggests:

On April 10, the CT Technology Council, the State's largest technology industry association, released a study titled "Connecticut Information Technology: Powering the Connecticut Economy." The report details the significance of "essential" and "related" Software/IT jobs to the Connecticut economy by showing the vast ripple effects they exert throughout the economy. Ten percent of workers are engaged in a Software/IT-related job — producing or using Information Technology — representing approximately 175,000 jobs out of 1.7 million jobs statewide. For each of Connecticut's "essential" Software/IT jobs (those that directly produce computer hardware, software or networks—approximately 66,000 jobs in 2001), another 2.33 jobs were created in the Connecticut economy. And each IT-related job generated an additional \$195,562 in personal income for Connecticut residents and more than \$23,400 in new State revenue through multiplier effects.<sup>3</sup>

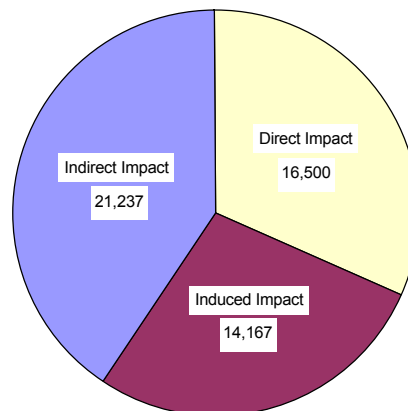
Consider, too, the numbers of positions relating to medical and biological work. One of the industrial clusters now attracting great attention in Connecticut is that of Bioscience. A study reported in the May 2002 **Connecticut Economic Digest**<sup>4</sup> highlights the importance of both the Information Technology and Bioscience clusters to the State economy. Bioscience activities are extremely important as the following chart shows:

### Bioscience's Impact on the Connecticut Economy

**Total R&D Expenditures in Billion \$  
(including compensation)**



**Employment**



\*Direct Impact: Generated by bioscience companies/organizations themselves.  
 \*Indirect Impact: Generated by companies doing business with bioscience companies.  
 \*Induced Impact: Changes in regional household spending patterns resulting from changes in regional employment/income. The regional employment changes are, in turn, generated by direct and indirect impacts.

Source: CURE, Seventh Annual Economic Report, March 26, 2002

Bioscience industries, moreover, remain healthy and have continued to generate positive balance sheets. Many recent advances in bioscience depend upon advances in computer technology, including such developments as microchips that can assess automatically the composition of complex organic compounds with obvious implications for such applications as domestic security. By the same token,

<sup>3</sup> "Industry Clusters, Connecticut Information Technology: Powering the Economy," Vol. 8, No. 5, p.4.

<sup>4</sup> "Connecticut Emerging as "Hot Spot" for Bioscience and Information Technology," Vol. 7, No. 5, p.4.

bioscience researchers are exploring organic computing applications at the nanotechnological level.



Connecticut also enjoys very strong capabilities in other advanced industries, particularly the aerospace industry and the transportation industries, which include shipbuilding and submarine work as well as manufacture of armored military vehicles. The realities of federal funding are particularly important for these groups, although the aerospace industry has moved away from its former reliance upon defense contracts and has become much more diverse. Defense expenditures, however, for the next several years promise to support a great deal of continued activity in these areas.

Changes in the aerospace industry provide an illustration of the kinds of changes occurring in manufacturing more generally in Connecticut. The **Connecticut Economic Digest** of August 2001 notes that "aerospace jobs, which accounted for 17.8 percent of the total manufacturing industry in 1990, shrank over the decade to 12.9 percent in 2000." But, in the same period, "the average annual wage per worker in the aerospace manufacturing industry grew 63 percent, while the overall private sector's rose by 60 percent. The aerospace industry paid an average of \$68,737 per worker in 2000, which was almost 15 percent higher than the manufacturing sector overall."<sup>5</sup> The following table shows the overall changing economic pattern:

Connecticut Aerospace Industry Covered Establishments, Employment, and Wages 1990 and 2000, Annual Averages										
Industry Code. Description	Establishments			Employment				Wages		
	1990	2000	90-00 % Chg	1990	2000	90-00 Chg.		1990	2000	90-00 % Chg
						No.	%			
Total Private Industries	100,215	104,569	4.3	1,420,078	1,462,534	42,456	3.0	\$28,841	\$46,027	59.6
Total Manufacturing	6,417	5,907	-7.9	343,099	262,508	-80,591	-23.5	\$35,696	\$59,966	68.0
37. Transportation Equipment	245	260	6.1	80,718	45,373	-35,345	-43.8	\$39,447	\$64,084	62.5
372. Aircraft and Parts (Aerospace)	164	173	5.5	61,029	33,898	-27,131	-44.5	\$42,177	\$68,737	63.0

As the total number of manufacturing establishments declined, those in both aerospace and transportation equipment increased by 6.1 and 5.5% over the period. Both industry groups, on the other hand, had rates of employment decline above 40%, nearly double that of manufacturing more generally. The data suggest that the overall patterns of development in the industry have moved toward much greater manufacturing efficiencies utilizing personnel having more extensive training and value.

<sup>5</sup> "Industry Profile, Aerospace," Vol. 6, No. 8, p.5.



Other areas with strong growth potential are those associated with optics and instrumentation, photonics and laser technologies generally, fuel cell technologies and associated mechanical applications, and various kinds of materials development and engineering. Applications that depend upon using extremely small-scale technologies, including nanotechnology, such as advanced robotics are also of great and growing importance. These technologies find uses all across the economic spectrum. Medical research uses increasingly sophisticated instrumentation, and medical facilities also depend upon more sophisticated devices for diagnosis and treatment. The need for instruments and techniques that can provide quick and reliable identification of potential biological, chemical, and other agents with possible terrorist or warfare uses is going to have an ongoing emphasis in various kinds of federal and other funding initiatives. Industrial innovations making use of smart machines relying upon microtechnologies also will enjoy ongoing emphasis. These fields require persons with advanced research capabilities in the physical sciences, chemistry and physics, as well as mathematics and engineering.

These associations have large implications for any kind of strong educational strategy to support leading technological economic sectors. Connecticut is located in the midst of advanced educational and research centers that will presumably produce the kinds of talent able to take advantage of opportunities in these sectors as they arise. However, recent issues around the issuance of visas to foreign nationals have highlighted an unfortunate reality in the system of higher education, particularly graduate education, in the United States. Natural sciences disciplines are not attractive at the graduate level to US students who can find much more remunerative employment in other areas without the necessity of the intense and sustained effort required for advanced scientific competency. Yet, it is that competency that graduate schools need if they are to provide advanced scientific instruction of the kind increasingly in demand in technologically advanced fields. The tightened scrutiny given to issuance of visas and sudden restrictions on the ability of foreigners to travel freely between their countries and their work in the United States has led to severe problems in many graduate research facilities that depend upon such students. In many instances, those students are leading advanced research projects whose results are now in jeopardy. The market provides no solution to this issue other than through further application of the ad hoc policy of multiplying visas for foreign students who find the situations attractive. A recent study cites findings from the National Science Foundation showing that from 1993 to 2000 sciences and engineering graduate students who were citizens or long-term residents declined by 14% overall. Mathematics and engineering suffered most while biological and information technology specialties, those fields most clearly offering immediate reward, increased only slightly. <sup>6</sup>

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<sup>6</sup> William Zumeta and Joyce s. Raveling, "Attracting the Best and the Brightest," Issues in Science and Technology OnLine, Winter 2002.



Evidence suggests that the most able of the available students tend to pursue careers that offer better economic reward in a shorter time frame. In time, a need may generate a level of compensation commensurate with the effort required, but in time facilities may lose their ability to respond to technological advances and find that others elsewhere have seized the initiative. Considerations of this kind may become more important as economic advance becomes more closely dependent upon advanced technologies and research. While projections indicate a need for advanced medical and bioscience research workers, for software and computer engineers and researchers, and for physical science and mathematical researchers, students turn instead to degree work leading to management and other professional positions.

### The Role of Occupations with Minimal Education Preparation

While those occupations at the top of the educational ladder are extremely important in terms of promoting overall economic growth, those occupations requiring minimal preparation are hardly insignificant. Several, too, occur as support positions in more advanced industries. The following table compares employment by occupation for 2000 and 2010, listed by occupations with largest expected annual openings and lowest preparation requirements.

Occupations with Least Preparation Requirements and Most Annual Openings							
JOB TITLE	2000 Empl.	2010 Empl.	Net Change	Percent Change	Total Annual Openings	Avg. Ann. Salary	Ed./ Trng. Code <sup>7</sup>
Retail Salespersons	54,640	60,690	6,050	11.1%	<b>2,570</b>	\$24,111	11
Cashiers	46,100	51,060	4,960	10.8%	<b>2,271</b>	\$17,901	11
Waiters and Waitresses	26,410	29,250	2,840	10.8%	<b>1,770</b>	\$17,240	11
Combined Food Preparation and Serving Workers, Including Fast Food	15,720	18,140	2,420	15.4%	<b>1,114</b>	\$18,405	11
Office Clerks, General	31,500	33,580	2,080	6.6%	<b>813</b>	\$26,570	11
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	29,610	32,270	2,660	9.0%	<b>801</b>	\$23,034	11
Nursing Aides, Orderlies, and Attendants	23,640	27,890	4,250	18.0%	<b>727</b>	\$26,294	11
Laborers and Freight, Stock, and Material Movers, Hand	22,180	22,830	650	2.9%	<b>684</b>	\$24,792	11
Teacher Assistants	20,730	22,980	2,260	10.9%	<b>659</b>	\$23,323	11
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	7,080	8,590	1,520	21.4%	<b>597</b>	\$17,485	11
Landscaping and Groundskeeping Workers	11,190	14,340	3,150	28.2%	<b>596</b>	\$26,276	11
Maids and Housekeeping Cleaners	15,850	18,160	2,320	14.6%	<b>576</b>	\$19,866	11
Food Preparation Workers	12,370	13,940	1,570	12.7%	<b>571</b>	\$20,724	11
Security Guards	14,570	15,920	1,350	9.2%	<b>532</b>	\$22,155	11
Stock Clerks and Order Fillers	20,800	20,250	-550	-2.6%	<b>510</b>	\$24,204	11

<sup>7</sup> Key: 11 - Short-term on-the-job training, 10 - Moderate-term on-the-job training, 9 - Long-term on-the-job training, 8 - Work experience in a related occupation

Occupations with Least Preparation Requirements and Most Annual Openings							
JOB TITLE	2000 Empl.	2010 Empl.	Net Change	Percent Change	Total Annual Openings	Avg. Ann. Salary	Ed./ Trng. Code <sup>7</sup>
Child Care Workers	12,640	13,820	1,180	9.3%	507	\$20,479	11
Receptionists and Information Clerks	13,430	15,490	2,060	15.3%	502	\$25,208	11
Packers and Packagers, Hand	10,540	11,370	840	8.0%	352	\$19,080	11
Home Health Aides	8,410	10,760	2,350	28.0%	342	\$24,516	11
Truck Drivers, Light or Delivery Services	14,330	15,590	1,260	8.8%	323	\$27,805	11
Tellers	6,720	6,020	-700	-10.4%	323	\$24,091	11
Bartenders	6,320	6,800	480	7.6%	298	\$17,894	11
Counter and Rental Clerks	4,780	5,330	550	11.5%	271	\$22,044	11
Customer Service Representatives	27,850	33,470	5,620	20.2%	798	\$31,794	10
Sales Representatives, Wholesale and Mfg., Except Tech/Scientific Products	20,140	19,980	-160	-0.8%	546	\$61,567	10
Bookkeeping, Accounting, and Auditing Clerks	28,510	28,130	-390	-1.4%	541	\$33,719	10
Secretaries, Except Legal, Medical, and Executive	27,870	27,020	-850	-3.1%	474	\$30,677	10
Executive Secretaries and Administrative Assistants	20,110	20,650	540	2.7%	396	\$40,398	10
Truck Drivers, Heavy and Tractor-Trailer	14,130	15,800	1,670	11.8%	361	\$37,733	10
Social and Human Service Assistants	7,790	10,220	2,430	31.2%	359	\$33,314	10
Medical Assistants	3,890	5,640	1,750	44.9%	278	\$29,523	10
Cooks, Restaurant	7,440	8,380	940	12.6%	305	\$24,230	9
Police and Sheriff's Patrol Officers	7,430	8,740	1,320	17.8%	288	\$48,725	9
Carpenters	10,580	11,560	980	9.3%	277	\$42,338	9
Supervisors/Managers of Office and Administrative Support Workers	21,340	21,940	600	2.8%	472	\$46,758	8
Supervisors/Managers of Retail Sales Workers	18,740	20,300	1,550	8.3%	426	\$39,215	8
Supervisors/Managers of Production and Operating Workers	10,870	10,070	-800	-7.3%	285	\$54,061	8

Among just those occupations with the minimal education requirement, short-term on the job training (Ed./Trng. Code 11), there are an estimated total of 17,709 jobs to be filled each year. Total employment in these occupations was 429,560 in 2000, or nearly a fourth of the total employed, and comprised an annual payroll in excess of \$9 billion. This category of job openings obviously plays a major economic role. It is not on the whole a source of growth, but a source of economic stability, although individual occupations may be part of growing industries. Unskilled workers and persons newly entering the labor market can find employment here. Among the latter will be many who will work part-time to improve their qualifications before moving on to higher paying employment, leaving vacancies behind for other new workers to fill.

In the absence of means that allow students with minimal economic resources to go directly to higher education, the jobs at the lower end of the spectrum provide a

means for such persons to improve their educational qualifications gradually. These persons represent an important resource for the Connecticut economy. Students going through occupational programs in community colleges generate now \$25 million in earnings, according to a recent news report.<sup>8</sup> The demographics of availability of potential students in Connecticut suggest that such persons may become still more important.

## **Demand vs. Supply – Identifying Areas for Targeting Education and Training**

Another way of looking at the occupational data is by comparing the number of job openings expected per year for the occupations to the number of program completers identified for a one-year period. Using this approach, the following occupational areas have been identified as reasonable areas for new or expanded training opportunities by institutions of higher education. These are occupations or groups of occupations that would seem to have more job openings available than there are individuals being trained to fill them. Not all occupations within a group may have the same good prospects, but as a whole, these occupations should provide better chances for employment after completing the appropriate education or training program. These are estimates, based on the best data available; other factors should be taken into consideration as well.

### Engineering/Science/Technology

In the engineering field, the best opportunities will probably be in mechanical engineering. There should also be opportunities in a group of other related technologies, which include biomedical, plastics, and toxicology. Media technology, including broadcast and sound technicians, is also an area that shows good opportunities.

### Health

There are a number of occupational areas within the health fields that will provide many opportunities over the next 10 years. Pharmacy and pharmacy support should



both show an undersupply of trained workers. Other areas that seem to be good prospects include: dental hygiene, medical records technology, medical technology, medical lab technicians, radiologic technology, respiratory therapy, registered nursing, veterinary technology/assisting, and medical support occupations such as EEG and EKG technicians. Rehabilitative therapy assistants may also provide opportunities.

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<sup>8</sup> Linda Conner Lambeck, "Budget wrangle highlights state education costs," *Connecticut Post*, July 3, 2003.

## Business

In the business field, there are a number of areas that should provide better opportunities: personnel administration, human services, economic and financial occupations, office supervision and management, office and information processing and scheduling occupations, banking and financial support services, accounting and bookkeeping clerks, and secretarial. Systems analysis and programming is an area where the numbers may not reflect the good opportunities that will be available because of the rapid changes in technology and changes to the occupational classification system. Best opportunities will probably be in areas such as networking, computer support and help desk occupations, information systems managers, software engineers, and systems analysts.

## Production and Repair

Although not necessarily a traditional area of training for Higher Education, there are a few occupations within this category that may offer good opportunities. Machinists and tool and die makers are occupations that will have many retirees within the next 10



years. Programs for some of the higher level technical occupations may be possibilities to consider. Other areas that might be considered include aircraft mechanics, graphics and printing occupations, and dental laboratory technology.

## Other

Other occupational categories that may provide excellent opportunities include: recreation, teacher assisting, library assisting, hospitality and travel services, child care, landscaping and horticulture, and culinary arts. There are other occupations that may also provide good opportunities for employment, but they may not require formal training, especially at the higher education level.

The table on the following page shows the estimated number of job openings annually based on the 2010 occupational employment projections as well as the number of program completers based on 2000-2001 data. Occupations and programs were aggregated into clusters to facilitate analysis.

A Comparison of Occupational Demand and Supply For Occupations Requiring Higher Education		
Occupational Group	Annual Job Openings	Recent Program Completers
<b>Engineering/Science/Technology</b>		
Mechanical Engineering/Technology	511	268
Media Technology	81	35
Other Related Technologies (Includes biomedical, plastics, toxicology)	75	19
<b>Health</b>		
Pharmacy	135	65
Pharmacy Support	182	81
Dental Hygiene	114	105
Medical Records Technology	68	5
Medical/Clinical Research Technology	71	41
Medical Laboratory Technicians	43	10
Radiologic Technology	196	86
Respiratory Therapy	74	46
Rehabilitative Therapy (Physical Therapy Assistants)	75	32
Registered Nursing	1235	863
Medical Support Occupations (EEG, EKG)	51	18
Veterinary Technology/Assisting	88	15
<b>Business</b>		
Personnel Administration	250	12
Human Services	880	267
Economic and Financial Specialties	1093	919
Systems Analysis and Programming	2611	2279
Office Supervision and Management	472	28
Office & Information Processing & Scheduling	3671	685
Banking and Financial Support Services	541	8
Accounting and Bookkeeping Clerks	697	243
Secretarial	939	251
<b>Production/Repair</b>		
Aircraft Mechanics	48	14
Graphics and Printing	246	71
Machine Tool/Machine Shop	916	95
Dental Laboratory Technology	10	5
<b>Other</b>		
Recreation	433	77
Teacher Assisting	659	17
Library Assisting	118	10
Hospitality and Travel Services	119	53
Child Care	507	178
Landscaping and Horticulture	643	11
Culinary Arts	1093	450

## Considerations for Policy and Planning

As decisions are made about how to target scarce educational resources, there are a number of considerations that should be kept in mind:

- The population as a whole in Connecticut has grown very slowly over the last decade. Likewise, the labor force has also grown very slowly, and with its aging population and consequent retirements, Connecticut should not see that trend change much in the near future. There will be a smaller pool of new workers available and thus a need to tap into new target groups. New pools of workers will include unskilled persons, especially those in jobs at the lower end of the spectrum who can improve their educational qualifications gradually and move on to more skilled and higher paying jobs, and new entrants to the labor force.

Although people are generally working longer now, with many workers switching careers after retiring, these older workers may not be as likely to seek training for the expanding high tech occupations. They may be more inclined to pursue opportunities in areas such as human services, business administration and management, hospitality and travel services, and health services that do not require as intensive or lengthy a training period.

As the baby boomer generation has aged, the number of people in the younger age groups has declined. The age groups following these declining numbers will again increase and schools have already begun to expand, creating shortages of teachers, particularly as teachers themselves among the baby boomers have begun to retire.

The population growth in the 1990s was largely made up of foreign immigrants. This had its own set of issues for education with the expanded need for English as a Second Language (ESL) and other adult education programs. However, with the new concerns over national security, this source of growth for the labor force may not be as prominent.

- When the economy improves and business hiring resumes, Connecticut may again see the worker shortage conditions that existed in the late '90s, accenting a mismatch between employer skill needs and the existing skills of job seekers. With fewer available workers, more effort will need to be expended to direct students into programs that match the needs of employers.

The trend in higher education, particularly graduate education, in the United States has been for students to seek opportunities in management and other professional positions that take less time to prepare for and offer higher salaries, rather than the mathematics, engineering, information technology, and science occupations that need more intensive preparation and are increasingly in demand in technologically advanced fields. Foreign students have been an important source to fill these positions in the past, but current security restrictions have greatly reduced the availability of this population.

- Rapid technological changes are changing the world of work, even in manufacturing. Although manufacturing continues to decline in Connecticut, what remains is likely to rely on very sophisticated machinery and techniques. In Connecticut, some areas of importance have been identified: bioscience, photonics, fuel cells, nanotechnology, software development, and the aerospace industry.

Bioscience industries remain healthy and have continued to generate positive balance sheets. The current emphasis on homeland security has led to the need for instruments and techniques that can provide quick and reliable identification of potential biological, chemical, and other agents with possible terrorist or warfare uses.

- Connecticut industry has become much more diverse, much less reliant upon large firms and particular industries, and much more affiliated with a global economy. The occupations growing fastest require higher levels of education. The state needs not only highly educated workers, but also highly educated teachers to produce them.

A large proportion of postsecondary teacher annual hiring requirements will be due to growth, reflecting the expanding school population. Postsecondary teachers train those persons who will be doing research and creating new products.

- Connecticut is poised to have an economy and industries that are attractive to high tech workers. Strategies should be put into place to ensure that we have the workforce to sustain that economy. We need to continue efforts to hire and keep graduates of State public and private colleges in Connecticut jobs and to attract additional skilled workers from other states.
- Employers are looking for employees with “soft” skills, such as communication (both oral and written), ability to work well with others, math and reading skills, and good work ethics. Education needs to find a way to address these core abilities in addition to the higher level technological skills that higher education specializes in and is so well suited to address.
- Higher education institutions are not the only ones offering training programs. When deciding which programs should be offered, consideration should also be given to what programs are being offered by private occupational schools and the regional vocational-technical schools, along with other possible training options such as those offered by businesses and community-based organizations. Higher education should perhaps concentrate its resources on programs that are not readily available elsewhere.

- Identifying new areas of need for training should be an ongoing process. Information gathering techniques such as vacancy surveys done on a regular basis can be used to identify how easily employers are filling their job openings and provide an opportunity to institute programs to address shortages as they arise.
- Having programs available won't do much to address shortages unless those programs attract students. Marketing of these programs needs to be an integral part of the process. This marketing can be done in partnership with businesses and community-based organizations as well as high schools. New strategies will have to be developed to target groups that have not traditionally sought out higher education opportunities. Given the population and demographic trends in Connecticut, that may be where the next available pool of workers will come from.
- Career planning, especially at early ages, can be an important tool for increasing awareness about what careers are predicted to have the best opportunities, and where training is available for those jobs. Career planning is necessary throughout life, and the earlier it begins, the better prepared an individual will be to make decisions about changing jobs and changing careers as opportunities present themselves.





## APPENDIX TABLES

### Connecticut's Top 60 – Fastest Growing Occupations

### Connecticut's Top 60 – Occupations with the Most New Jobs

### Connecticut's Top 60 – Occupations with the Most Employment Opportunities

The occupations listed in these tables generally require at least some postsecondary education or training. Only those occupations in which at least 800 persons statewide are employed were included. The complete lists are available in the publication **Connecticut Forecast 2000 to 2010**, published by the Connecticut Department of Labor, or can be found on the Department's Web site at [www.ctdol.state.ct.us/lmi](http://www.ctdol.state.ct.us/lmi).

The tables use the following **Education/Training Codes:**

- 1 - First professional degree
- 2 - Doctoral degree
- 3 - Master's degree
- 4 - Work experience plus bachelor's or higher degree
- 5 - Bachelor's degree
- 6 - Associate degree
- 7 - Postsecondary vocational training

<b>CONNECTICUT'S TOP 60 – FASTEST GROWING OCCUPATIONS</b> requiring education or training beyond high school							
<b>JOB TITLE</b>	<b>2000 Empl.</b>	<b>2010 Empl.</b>	<b>Net Change</b>	<b>Percent Change</b>	<b>Total Annual Openings</b>	<b>Avg. Ann. Salary</b>	<b>Ed/Trng Code</b>
Computer Support Specialists	7,720	12,980	5,260	68.1%	558	\$45,796	6
Computer Software Engineers, Systems Software	2,430	3,920	1,490	61.4%	166	\$69,927	5
Network and Computer Systems Administrators	3,460	5,450	2,000	57.8%	214	\$64,011	5
Computer Software Engineers, Applications	6,720	10,560	3,850	57.3%	429	\$76,431	5
Database Administrators	1,930	2,910	980	51.0%	106	\$63,250	5
Network Systems and Data Communications Analysts	2,290	3,440	1,160	50.5%	125	\$63,290	5
Computer Specialists, All Other	2,040	3,030	990	48.8%	117	\$63,250	7
Physician Assistants	800	1,140	340	42.1%	51	\$68,506	5
Personal Financial Advisors	2,230	3,150	920	41.3%	118	\$85,372	5
Medical Scientists, Except Epidemiologists	1,550	2,130	580	37.3%	93	\$83,869	2
Computer Systems Analysts	8,970	12,300	3,330	37.1%	412	\$66,923	5
Gaming Dealers	2,700	3,680	980	36.5%	191	\$17,710	7
Medical Records and Health Information Technicians	1,170	1,590	420	36.0%	68	\$32,513	6
Computer and Information Systems Managers	4,640	6,240	1,600	34.6%	239	\$98,611	4
Biochemists and Biophysicists	1,380	1,810	430	31.0%	93	\$70,231	2
Securities, Commodities, and Financial Services Sales Agents	5,850	7,660	1,810	30.9%	228	\$94,952	5
Gaming Supervisors	810	1,060	250	30.7%	48	\$42,420	7
Substance Abuse and Behavioral Disorder Counselors	940	1,230	290	30.4%	48	\$36,724	3
Microbiologists	880	1,140	260	29.8%	58	N/A	2
Mental Health and Substance Abuse Social Workers	1,780	2,300	520	29.4%	72	\$46,699	3
Medical and Public Health Social Workers	2,170	2,800	630	28.9%	87	\$44,324	5
Radiation Therapists	820	1,050	230	28.1%	40	\$42,599	6
Respiratory Therapists	1,030	1,320	290	27.7%	55	\$46,364	6
Speech-Language Pathologists	1,380	1,750	370	26.9%	72	\$59,931	3
Occupational Therapists	1,290	1,620	340	26.1%	66	\$59,191	5
Physical Therapists	2,510	3,150	640	25.5%	127	\$64,102	3
Public Relations Specialists	2,560	3,200	650	25.3%	108	\$49,845	5
Manicurists and Pedicurists	1,310	1,640	330	25.1%	65	\$21,797	7
Public Relations Managers	1,060	1,320	260	24.2%	42	\$76,805	4
Medical Transcriptionists	860	1,060	200	23.7%	43	\$33,443	7

<b>CONNECTICUT'S TOP 60 – FASTEST GROWING OCCUPATIONS</b> requiring education or training beyond high school							
<b>JOB TITLE</b>	<b>2000 Empl.</b>	<b>2010 Empl.</b>	<b>Net Change</b>	<b>Percent Change</b>	<b>Total Annual Openings</b>	<b>Avg. Ann. Salary</b>	<b>Ed/Trng Code</b>
Dental Hygienists	2,990	3,700	700	23.5%	114	\$58,389	6
Veterinarians	850	1,050	200	23.1%	35	\$73,681	1
Marketing Managers	3,370	4,140	780	23.0%	126	\$96,218	4
Sales Managers	4,770	5,840	1,070	22.4%	176	\$94,654	4
Advertising and Promotions Managers	1,500	1,840	330	22.3%	55	\$79,177	4
Veterinary Technologists and Technicians	980	1,190	220	22.0%	47	\$27,916	6
Producers and Directors	910	1,110	200	21.8%	38	\$62,783	4
Community and Social Service Specialists, All Other	1,840	2,230	390	21.0%	71	\$36,673	5
Art Directors	870	1,050	180	20.7%	36	\$76,096	4
Radiologic Technologists and Technicians	2,670	3,230	550	20.7%	114	\$44,639	6
Graphic Designers	3,060	3,680	620	20.2%	93	\$43,401	5
Registered Nurses	30,560	36,740	6,180	20.2%	1,235	\$53,934	6
Medical and Health Services Managers	3,410	4,100	690	20.2%	128	\$79,332	4
Fitness Trainers and Aerobics Instructors	4,720	5,670	950	20.0%	192	\$38,567	7
Pharmacists	2,610	3,110	500	19.1%	128	\$77,568	1
Emergency Medical Technicians and Paramedics	2,540	3,010	470	18.6%	112	\$29,844	7
Financial Specialists, All Other	2,300	2,720	420	18.1%	88	\$55,723	5
Financial Analysts	5,150	6,080	930	18.0%	163	\$74,712	5
Educational, Vocational, and School Counselors	2,980	3,520	540	18.0%	115	\$51,326	3
Credit Analysts	1,480	1,740	260	17.5%	56	\$59,256	5
Healthcare Practitioners and Technical Workers, All Other	1,010	1,180	180	17.4%	44	\$47,866	5
Family and General Practitioners	2,130	2,500	370	17.4%	69	\$118,787	1
Physicians and Surgeons, All Other	1,020	1,190	180	17.2%	33	\$126,063	1
Postsecondary Teachers, All Other	4,960	5,790	840	16.9%	219	\$56,720	2
Aerospace Engineers	3,080	3,590	510	16.6%	134	\$73,813	5
Editors	2,130	2,470	340	15.8%	103	\$52,676	5
Property, Real Estate, and Community Association Managers	2,750	3,180	430	15.7%	88	\$60,986	5
Medical and Clinical Laboratory Technologists	1,730	1,990	270	15.6%	67	\$50,545	5
Market Research Analysts	2,610	3,010	410	15.6%	98	\$64,691	5
Instructional Coordinators	1,500	1,740	230	15.4%	45	\$57,739	3

<b>CONNECTICUT'S TOP 60 – OCCUPATIONS WITH THE MOST NEW JOBS</b> requiring education or training beyond high school							
<b>JOB TITLE</b>	<b>2000 Empl.</b>	<b>2010 Empl.</b>	<b>Net Change</b>	<b>Percent Change</b>	<b>Total Annual Openings</b>	<b>Avg. Ann. Salary</b>	<b>Ed/Trng Code</b>
Registered Nurses	30,560	36,740	6,180	20.2%	1,235	\$53,934	6
Computer Support Specialists	7,720	12,980	5,260	68.1%	558	\$45,796	6
Computer Software Engineers, Applications	6,720	10,560	3,850	57.3%	429	\$76,431	5
Computer Systems Analysts	8,970	12,300	3,330	37.1%	412	\$66,923	5
Network and Computer Systems Administrators	3,460	5,450	2,000	57.8%	214	\$64,011	5
Accountants and Auditors	17,910	19,730	1,830	10.2%	448	\$61,110	5
Securities, Commodities, and Financial Services Sales Agents	5,850	7,660	1,810	30.9%	228	\$94,952	5
General and Operations Managers	24,120	25,860	1,740	7.2%	580	\$99,844	4
Computer and Information Systems Managers	4,640	6,240	1,600	34.6%	239	\$98,611	4
Computer Software Engineers, Systems Software	2,430	3,920	1,490	61.4%	166	\$69,927	5
Business Operations Specialists, All Other	10,620	12,010	1,380	13.0%	408	\$55,620	5
Automotive Service Technicians and Mechanics	10,960	12,290	1,330	12.2%	392	\$36,630	7
Financial Managers	10,260	11,430	1,170	11.4%	274	\$92,737	4
Network Systems and Data Communications Analysts	2,290	3,440	1,160	50.5%	125	\$63,290	5
Management Analysts	8,520	9,650	1,130	13.3%	188	\$74,515	4
Sales Managers	4,770	5,840	1,070	22.4%	176	\$94,654	4
Computer Specialists, All Other	2,040	3,030	990	48.8%	117	\$63,250	7
Licensed Practical and Licensed Vocational Nurses	7,010	7,990	980	14.0%	278	\$43,320	7
Gaming Dealers	2,700	3,680	980	36.5%	191	\$17,710	7
Database Administrators	1,930	2,910	980	51.0%	106	\$63,250	5
Fitness Trainers and Aerobics Instructors	4,720	5,670	950	20.0%	192	\$38,567	7
Financial Analysts	5,150	6,080	930	18.0%	163	\$74,712	5
Personal Financial Advisors	2,230	3,150	920	41.3%	118	\$85,372	5
Postsecondary Teachers, All Other	4,960	5,790	840	16.9%	219	\$56,720	2
Secondary School Teachers, Except Special and Vocational Education	12,520	13,310	790	6.3%	460	\$55,852	5
Marketing Managers	3,370	4,140	780	23.0%	126	\$96,218	4
Recreation Workers	5,650	6,420	770	13.7%	194	\$23,421	5
Medical Secretaries	5,110	5,830	720	14.1%	159	\$31,579	7
Dental Hygienists	2,990	3,700	700	23.5%	114	\$58,389	6
Medical and Health Services Managers	3,410	4,100	690	20.2%	128	\$79,332	4

<b>CONNECTICUT'S TOP 60 – OCCUPATIONS WITH THE MOST NEW JOBS</b> requiring education or training beyond high school							
<b>JOB TITLE</b>	<b>2000 Empl.</b>	<b>2010 Empl.</b>	<b>Net Change</b>	<b>Percent Change</b>	<b>Total Annual Openings</b>	<b>Avg. Ann. Salary</b>	<b>Ed/Trng Code</b>
Hairdressers, Hairstylists, and Cosmetologists	9,530	10,220	690	7.2%	302	\$24,628	7
Public Relations Specialists	2,560	3,200	650	25.3%	108	\$49,845	5
Child, Family, and School Social Workers	4,450	5,090	640	14.4%	114	\$48,028	5
Physical Therapists	2,510	3,150	640	25.5%	127	\$64,102	3
Medical and Public Health Social Workers	2,170	2,800	630	28.9%	87	\$44,324	5
Graphic Designers	3,060	3,680	620	20.2%	93	\$43,401	5
Teachers, Primary, Secondary, and Adult, All Other	5,450	6,040	600	10.9%	114	\$41,097	5
Medical Scientists, Except Epidemiologists	1,550	2,130	580	37.3%	93	\$83,869	2
Radiologic Technologists and Technicians	2,670	3,230	550	20.7%	114	\$44,639	6
Educational, Vocational, and School Counselors	2,980	3,520	540	18.0%	115	\$51,326	3
Mental Health and Substance Abuse Social Workers	1,780	2,300	520	29.4%	72	\$46,699	3
Aerospace Engineers	3,080	3,590	510	16.6%	134	\$73,813	5
Pharmacists	2,610	3,110	500	19.1%	128	\$77,568	1
Emergency Medical Technicians and Paramedics	2,540	3,010	470	18.6%	112	\$29,844	7
Property, Real Estate, and Community Association Managers	2,750	3,180	430	15.7%	88	\$60,986	5
Biochemists and Biophysicists	1,380	1,810	430	31.0%	93	\$70,231	2
Financial Specialists, All Other	2,300	2,720	420	18.1%	88	\$55,723	5
Medical Records and Health Information Technicians	1,170	1,590	420	36.0%	68	\$32,513	6
Market Research Analysts	2,610	3,010	410	15.6%	98	\$64,691	5
Construction Managers	3,120	3,530	400	12.9%	91	\$83,020	5
Lawyers	10,840	11,230	400	3.6%	112	\$100,633	1
Community and Social Service Specialists, All Other	1,840	2,230	390	21.0%	71	\$36,673	5
Special Education Teachers, Preschool, Kindergarten, and Elementary School	3,100	3,480	390	12.5%	78	\$53,609	5
Family and General Practitioners	2,130	2,500	370	17.4%	69	\$118,787	1
Speech-Language Pathologists	1,380	1,750	370	26.9%	72	\$59,931	3
Social and Community Service Managers	3,350	3,710	360	10.9%	99	\$54,200	5
Preschool Teachers, Except Special Education	7,040	7,390	360	5.0%	123	\$51,732	5
Chief Executives	4,320	4,660	340	7.9%	170	\$127,555	4
Rehabilitation Counselors	3,490	3,830	340	9.8%	106	\$35,628	3
Editors	2,130	2,470	340	15.8%	103	\$52,676	5

<b>CONNECTICUT'S TOP 60 – OCCUPATIONS WITH THE MOST EMPLOYMENT OPPORTUNITIES</b> requiring education or training beyond high school							
<b>JOB TITLE</b>	<b>2000 Empl.</b>	<b>2010 Empl.</b>	<b>Net Change</b>	<b>Percent Change</b>	<b>Total Annual Openings</b>	<b>Avg. Ann. Salary</b>	<b>Ed/Trng Code</b>
Registered Nurses	30,560	36,740	6,180	20.2%	1,235	\$53,934	6
General and Operations Managers	24,120	25,860	1,740	7.2%	580	\$99,844	4
Computer Support Specialists	7,720	12,980	5,260	68.1%	558	\$45,796	6
Secondary School Teachers, Except Special and Vocational Education	12,520	13,310	790	6.3%	460	\$55,852	5
Accountants and Auditors	17,910	19,730	1,830	10.2%	448	\$61,110	5
Elementary School Teachers, Except Special Education	16,560	16,760	200	1.2%	430	\$54,249	5
Computer Software Engineers, Applications	6,720	10,560	3,850	57.3%	429	\$76,431	5
Computer Systems Analysts	8,970	12,300	3,330	37.1%	412	\$66,923	5
Business Operations Specialists, All Other	10,620	12,010	1,380	13.0%	408	\$55,620	5
Automotive Service Technicians and Mechanics	10,960	12,290	1,330	12.2%	392	\$36,630	7
Hairdressers, Hairstylists, and Cosmetologists	9,530	10,220	690	7.2%	302	\$24,628	7
Licensed Practical and Licensed Vocational Nurses	7,010	7,990	980	14.0%	278	\$43,320	7
Financial Managers	10,260	11,430	1,170	11.4%	274	\$92,737	4
Computer and Information Systems Managers	4,640	6,240	1,600	34.6%	239	\$98,611	4
Computer Programmers	10,220	10,380	150	1.5%	230	\$68,100	5
Securities, Commodities, and Financial Services Sales Agents	5,850	7,660	1,810	30.9%	228	\$94,952	5
Postsecondary Teachers, All Other	4,960	5,790	840	16.9%	219	\$56,720	2
Network and Computer Systems Administrators	3,460	5,450	2,000	57.8%	214	\$64,011	5
Middle School Teachers, Except Special and Vocational Education	8,350	8,440	90	1.1%	199	\$53,335	5
Recreation Workers	5,650	6,420	770	13.7%	194	\$23,421	5
Insurance Sales Agents	7,570	7,210	-360	-4.7%	193	\$60,580	5
Fitness Trainers and Aerobics Instructors	4,720	5,670	950	20.0%	192	\$38,567	7
Gaming Dealers	2,700	3,680	980	36.5%	191	\$17,710	7
Management Analysts	8,520	9,650	1,130	13.3%	188	\$74,515	4
Mechanical Engineers	5,290	5,530	240	4.6%	179	\$64,021	5
Sales Managers	4,770	5,840	1,070	22.4%	176	\$94,654	4
Chief Executives	4,320	4,660	340	7.9%	170	\$127,555	4
Computer Software Engineers, Systems Software	2,430	3,920	1,490	61.4%	166	\$69,927	5
Financial Analysts	5,150	6,080	930	18.0%	163	\$74,712	5
Medical Secretaries	5,110	5,830	720	14.1%	159	\$31,579	7

<b>CONNECTICUT'S TOP 60 – OCCUPATIONS WITH THE MOST EMPLOYMENT OPPORTUNITIES</b> requiring education or training beyond high school							
<b>JOB TITLE</b>	<b>2000 Empl.</b>	<b>2010 Empl.</b>	<b>Net Change</b>	<b>Percent Change</b>	<b>Total Annual Openings</b>	<b>Avg. Ann. Salary</b>	<b>Ed/Trng Code</b>
<b>Aerospace Engineers</b>	3,080	3,590	510	16.6%	<b>134</b>	\$73,813	5
<b>Medical and Health Services Managers</b>	3,410	4,100	690	20.2%	<b>128</b>	\$79,332	4
<b>Pharmacists</b>	2,610	3,110	500	19.1%	<b>128</b>	\$77,568	1
<b>Physical Therapists</b>	2,510	3,150	640	25.5%	<b>127</b>	\$64,102	3
<b>Marketing Managers</b>	3,370	4,140	780	23.0%	<b>126</b>	\$96,218	4
<b>Network Systems and Data Communications Analysts</b>	2,290	3,440	1,160	50.5%	<b>125</b>	\$63,290	5
<b>Preschool Teachers, Except Special Education</b>	7,040	7,390	360	5.0%	<b>123</b>	\$51,732	5
<b>Personal Financial Advisors</b>	2,230	3,150	920	41.3%	<b>118</b>	\$85,372	5
<b>Computer Specialists, All Other</b>	2,040	3,030	990	48.8%	<b>117</b>	\$63,250	7
<b>Educational, Vocational, and School Counselors</b>	2,980	3,520	540	18.0%	<b>115</b>	\$51,326	3
<b>Dental Hygienists</b>	2,990	3,700	700	23.5%	<b>114</b>	\$58,389	6
<b>Child, Family, and School Social Workers</b>	4,450	5,090	640	14.4%	<b>114</b>	\$48,028	5
<b>Teachers, Primary, Secondary, and Adult, All Other</b>	5,450	6,040	600	10.9%	<b>114</b>	\$41,097	5
<b>Radiologic Technologists and Technicians</b>	2,670	3,230	550	20.7%	<b>114</b>	\$44,639	6
<b>Emergency Medical Technicians and Paramedics</b>	2,540	3,010	470	18.6%	<b>112</b>	\$29,844	7
<b>Lawyers</b>	10,840	11,230	400	3.6%	<b>112</b>	\$100,633	1
<b>Welders, Cutters, Solderers, and Brazers</b>	3,900	3,820	-80	-2.0%	<b>109</b>	\$33,542	7
<b>Public Relations Specialists</b>	2,560	3,200	650	25.3%	<b>108</b>	\$49,845	5
<b>Database Administrators</b>	1,930	2,910	980	51.0%	<b>106</b>	\$63,250	5
<b>Rehabilitation Counselors</b>	3,490	3,830	340	9.8%	<b>106</b>	\$35,628	3
<b>Bus and Truck Mechanics and Diesel Engine Specialists</b>	2,740	3,080	340	12.2%	<b>104</b>	\$40,405	7
<b>Editors</b>	2,130	2,470	340	15.8%	<b>103</b>	\$52,676	5
<b>Social and Community Service Managers</b>	3,350	3,710	360	10.9%	<b>99</b>	\$54,200	5
<b>Market Research Analysts</b>	2,610	3,010	410	15.6%	<b>98</b>	\$64,691	5
<b>Graphic Designers</b>	3,060	3,680	620	20.2%	<b>93</b>	\$43,401	5
<b>Medical Scientists, Except Epidemiologists</b>	1,550	2,130	580	37.3%	<b>93</b>	\$83,869	2
<b>Biochemists and Biophysicists</b>	1,380	1,810	430	31.0%	<b>93</b>	\$70,231	2
<b>Construction Managers</b>	3,120	3,530	400	12.9%	<b>91</b>	\$83,020	5
<b>Property, Real Estate, and Community Association Managers</b>	2,750	3,180	430	15.7%	<b>88</b>	\$60,986	5
<b>Financial Specialists, All Other</b>	2,300	2,720	420	18.1%	<b>88</b>	\$55,723	5



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