



Northland Pioneer College

EXPANDING MINDS • TRANSFORMING LIVESSM

NPC Construction Program Feasibility Study

November 26

2012

Northland Pioneer College

PO Box 610

Holbrook, AZ 86025

Ken Wilk, CPC, M. Eng.

Faculty/Department Chair Construction

Phone: 928-536-6246

Kenneth.wilk@npc.edu

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	2
2. DESCRIPTION OF PRODUCTS AND SERVICES	2
3. TECHNOLOGY CONSIDERATIONS	2
4. PRODUCT/SERVICE MARKETPLACE	3
5. MARKETING STRATEGY	5
6. ORGANIZATION AND STAFFING	6
7. SCHEDULE.....	7
8. FINANCIAL PROJECTIONS	12
9. FINDINGS AND RECOMMENDATIONS.....	14

Approved

1. EXECUTIVE SUMMARY

The Construction Program (CON) will create, support, and promote lifelong learners by instilling basic life skills of the building trades and trade management skills required to create effective constructors. In the fall of 2013 we plan on having our program operational in Holbrook integrated with the existing NAVIT curriculum with a dual enrollment option at a few high schools in the area.

2. DESCRIPTION OF PRODUCTS AND SERVICES

We will have several tracts available for our students: the first will be a National Center for Construction Education and Research (NCCER) accredited program offering construction technology courses; the second will be a certificate program targeting drafting students. Both degree and certificate programs will have some support for students desiring to transfer¹ institutions within the state/country. Additionally, with input from our Construction Advisory Council, we may offer a specialty tract for green construction, electrical, industrial, or heavy highway construction. Based upon community demand we would like to develop several weekend continual education programs ranging from basic electrical and carpentry to general home repair to cultivate constant learning within our community.

NPC's strategic pillars will be at the forefront of our program. Continually advancing learning opportunities, accountability, and relevant technology will be the capstone of our program. We will accomplish this through online assessments and feedback and computer labs containing Trimble Sketch-up, Microsoft Project, and the other computer applications relevant to construction.

We will also seek NCCER accreditation to increase the marketability and transferability of our curriculum to any institution that has NCCER accreditation. NCCER is a nationally recognized accrediting organization. There are several NCCER accredited programs within the state that provide options for students to complete apprenticeships with NCCER curriculum². Many of our courses will transfer to in four year degree institutions for bachelor's degree programs³.

3. TECHNOLOGY CONSIDERATIONS

The new NPC Skills Center is has been awarded to a general contractor and is on track to be operational in Holbrook for the fall of 2013 academic year and will be equipped with modern computer and training equipment to provide our students with technological literacy. Global positioning software on construction equipment, three dimensional laser area scanners, computer modeling techniques, and other advances in construction methods have increased the level of tech

¹ Northern Arizona's Construction Management Program or other 4 year ACCE accredited program and ASU has a transfer program for CTE students seeking four year degrees

² The Arizona Builder's Alliance is one example of an apprenticeship program.

³ There will likely be an articulation agreement with NAU to transfer students into their CM program and to a four year program at ASU.

savvy constructors needed in the market place. Social media is another trend in business our students will need to keep abreast of. Some companies are experimenting with tablet PC applications for daily timecards and production rates. This does not negate the need for human workers, but it does require a basic familiarity with computers and other practices commonly used in the construction industry today.

4. Student Employment Prospects

The current employment conditions for our students are marginal (refer to appendix A). There is positive data supporting strong demand for construction trades workers nationally, but the local market employment prospects indicated many in a recent survey to our advisory council members that about 25% of the firms in our survey are looking for new employees (refer to appendix A). Our students would not be well suited for the Peace-Corp, however, they would be excellently prepared to participate domestically in AmeriCorps Vista and NCCC programs giving them 10 months of intensive training according to the AmeriCorps website⁴:

“AmeriCorps NCCC Service Through Teamwork

AmeriCorps NCCC (National Civilian Community Corps) is a full-time, team-based residential program for men and women age 18–24. Members are assigned to one of five campuses, located in Denver, Colorado; Sacramento, California; Perry Point, Maryland; Vicksburg, Mississippi; and Vinton, Iowa.

The mission of AmeriCorps NCCC is to strengthen communities and develop leaders through direct, team-based national and community service. In partnership with non-profits—secular and faith based, local municipalities, state governments, federal government, national or state parks, Indian Tribes and schools members complete service projects throughout the region they are assigned.

Drawn from the successful models of the Civilian Conservation Corps of the 1930s and the U.S. military, AmeriCorps NCCC is built on the belief that civic responsibility is an inherent duty of all citizens and that national service programs work effectively with local communities to address pressing needs.”

Bureau of Labor Statistics Data and Additional Career Opportunities

Locally, our economy has been affected adversely by the recent housing boom and crash meaning new construction is slow and prices of homes for sale is less per square foot than

⁴ <http://www.americorps.gov/about/programs/nccc.asp>

the cost to build them new. There is a surplus of vacant homes and commercial office buildings on the market. Local employment opportunities will take a few years to recover completely (prior to 2007 employment levels) and most efforts are focused on existing structure upgrades. Currently, houses are selling for less per square foot than the cost to construct new house. This is creating a challenge for our area contractors. A few contractors on the NPC Construction Advisory Council have expressed some opportunities for remodeling of existing structures. Nationally the Bureau of Labor Statistics (BLS) reports hiring conditions for building trades professional remaining fairly strong comparatively with other major industry groups like health care, business, and retail trade. Construction is third with approximately 1800 new jobs anticipated in the next decade (refer to appendix B). According to the BLS the following are starting wage rates for construction workers⁵:

Wages for construction equipment operators vary. In May 2008, median hourly wages of wage and salary operating engineers and other construction equipment operators were \$18.88. The middle 50 percent earned between \$14.78 and \$25.49. The lowest 10 percent earned less than \$12.47, and the highest 10 percent earned more than \$33.34. Median hourly wages in the industries employing the largest numbers of operating engineers were as follows:

<i>Nonresidential building construction</i>	<i>\$21.45</i>
<i>Highway, street, and bridge construction</i>	<i>21.20</i>
<i>Utility system construction</i>	<i>19.79</i>
<i>Other specialty trade contractors</i>	<i>18.61</i>
<i>Local government</i>	<i>17.19</i>

Median hourly wages of wage and salary paving, surfacing, and tamping equipment operators were \$16.00 in May 2008. The middle 50 percent earned between \$12.94 and \$20.75. The lowest 10 percent earned less than \$10.77, and the highest 10 percent earned more than \$26.70. Median hourly wages in the industries employing the largest numbers of paving, surfacing, and tamping equipment operators were as follows:

<i>Other specialty trade contractors</i>	<i>\$16.16</i>
<i>Highway, street, and bridge construction</i>	<i>16.13</i>
<i>Local government</i>	<i>15.94</i>

In May 2008, median hourly wages of wage and salary piledriver operators were \$23.01. The middle 50 percent earned between \$17.52 and \$32.94. The lowest 10 percent earned less than

⁵ <http://www.bls.gov/oes/current/oes472061.htm>

\$14.25, and the highest 10 percent earned more than \$38.01. Median hourly wages in the industries employing the largest numbers of piledriver operators were as follows:

<i>Other specialty trade contractors</i>	<i>\$26.07</i>
<i>Other heavy and civil engineering construction</i>	<i>23.24</i>
<i>Nonresidential building construction</i>	<i>20.46</i>
<i>Utility system construction</i>	<i>19.54</i>

Hourly pay is relatively high, particularly in large metropolitan areas. However, annual earnings of some workers may be lower than hourly rates would indicate because work time may be limited by bad weather. About 27 percent of construction equipment operators belong to a union. These wage rates are indicative for entry level personal. Foreman superintendent and other managerial staff are likely to earn \$40,000.00 to \$90,000.00 annually.

Students' from our program may pursue careers in:

Quality Control

Estimators

Building trades

Forman and trades supervisors

Superintendents

Building inspectors and Officials

Safely and quality control inspectors

5. MARKETING STRATEGY

Currently in the state, Coconino Community College in Flagstaff offers a Construction Program that has a building trades and 2 year associate degree transfer tract program. Northern Arizona University and Arizona State University both have Construction Management programs that have extensive graduate level programs with research components. ITT Technical University offers a Construction Management four year degree program. Central Arizona College has a four year equipment operators program.

We are not in any direct competition with any of the aforementioned programs; we are only offer services unique to Navajo/Apache Counties. We plan to work symbiotically with NAU and ASU⁶. Our program will be more hands on and trades oriented offering some basic superintendent management skills complimentary to the hands on rigors of our program. This will position NPC in a unique niche in accordance with the demand of our local market for employment.

⁶ This should offer our students two potential articulation agreements so they have a transfer tract to a four year institution to attain a bachelor's degree.

The CON Program will attract high school students/young adults to develop their expertise while simultaneously providing them with a foundation to grasp and develop in managerial positions once relevant experience is acquired. We will also target skilled craftspeople with novice managerial skills and create intensive workshops to further develop expertise and abilities as working professionals in the region. We will market the CON Program to high schools, through social media, newspaper, and regional commerce development groups.

For our community non-expert construction learners we will market our CON Program by developing introductory level seminars (on weekends and evening) that offer opportunities for the community to expand their scholastic level and to develop their construction talents. Classes will range from basic carpentry to electrical repair.

NPC will begin marketing construction skills and trades to 6 -14 year old children through the newly formed Kid's College. This unique college opportunity program seeks to introduce children to college in fun and interactive ways that alleviates the fear of the unknown and instills the prospect of college to students at an early age. Last year's programs in Show Low and Snowflake were a success. Plans to expand the program to other locations are in the works. Once the CON Program is in full swing we plan to develop a class involving teaching career and technical education. The class will provide opportunities for students (over 18) to gain real world experience teaching young learners.

The length of the program will vary from six month certificates to 2 years applied science degrees offered in conjunction with NAVIT programs and through dual enrollment. Initially, the CON program will be based out of the new NPC Skills Center in Holbrook (in time with its completion date in the fall of 2013).

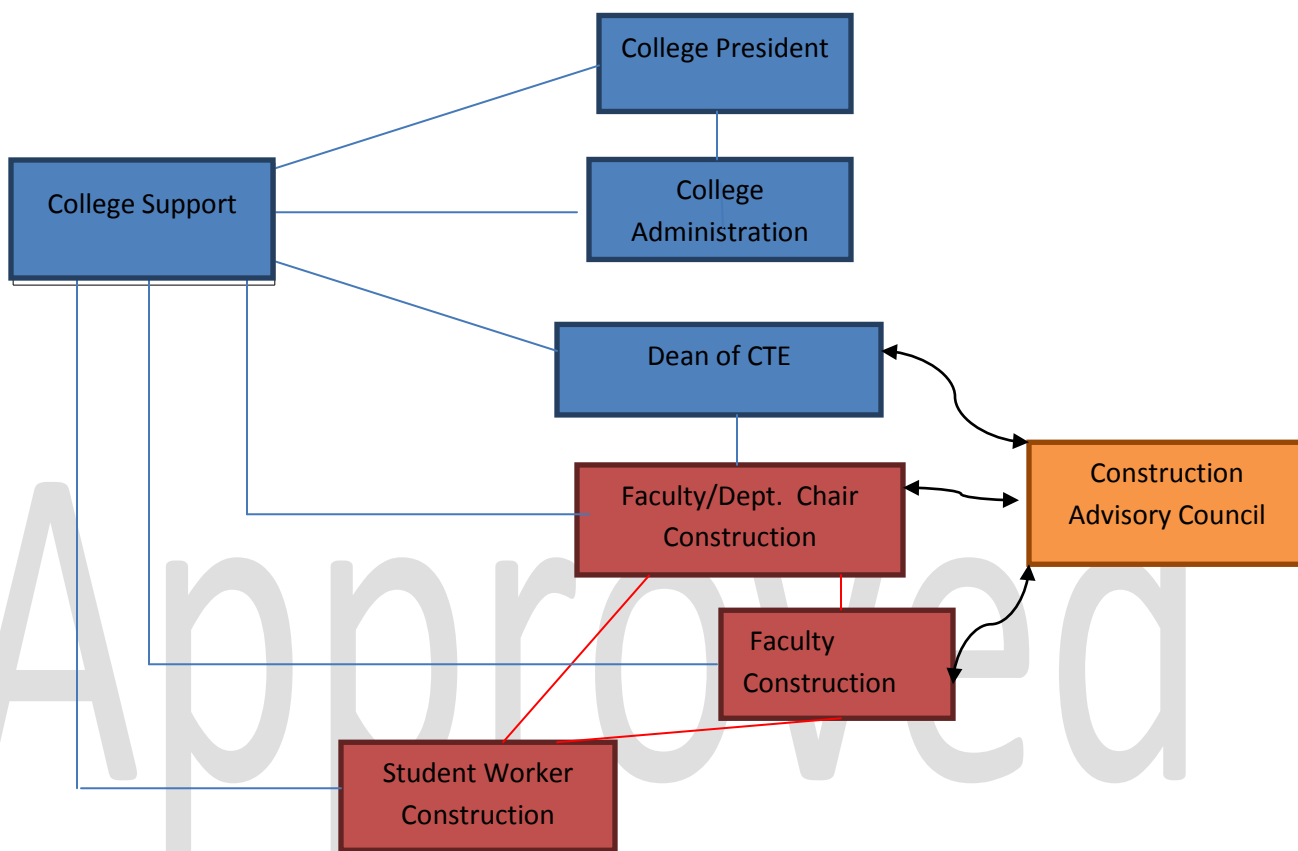
NPC's CON program is currently offering and will continue to offer OSHA authorized 10 and 30 hour outreach training sessions and cards to provide workers with basic federal safety training and credentials. This safety training cards are mandatory for employment on some federal and state funded construction projects. This training will be part of the introductory CON 100 classes further developing our students' work- readiness as well as the work- readiness of our regional community.

6. ORGANIZATION AND STAFFING

Staffing for the CON Program will likely need one full time faculty/chair position and one faculty position⁷. This will provide the CON Program with two fulltime employees. The Faculty/Department Chair will report to the Dean of Career and Technical Education and receive input and guidance from the Construction Advisory Council. College Administration and support staff will have oversight and

⁷ The second faculty member will be a NAVIT instructor to assist the chair in student instruction. This instructor duty will include Friday NAVIT class sessions and a slightly earlier start date than regular faculty.

guidance of the CON Program through the Faculty/Department Chair. Adjunct faculty for the CON Program will report to the Department Chair.



7. SCHEDULE

The CON Program at NPC will be implemented in multiple phases over the next calendar year ultimately seeking initial implementation in the fall of 2013. Each phase has a specific intent to ultimately reinstate and modernize the Construction, Heavy Equipment (HQO), and Drafting (DRF) curriculum taught at NPC.

Possible effected programs may include:

BOC (program deletion)

Drafting (description modifications)

Business and AIS (some classes may be used in our program as restricted electives)

Heavy Equipment (revisions/deletions)

Welding (several cross listed classes and requisite changes)

Speech, Theatre, and Film (a few classes modified for perquisites and cross listed)

Phase One with approximately nineteen classes will provide student the ability to attain a certificate of proficiency and the initial curriculum of Associates of Applied Science degree in CON. The Intent of Phase One is to provide the community with a direct to employment broad craft skills program and a dual enrollment program for CON and Drafting (DRF).

Phase Two will attain modifications of course descriptions and topics for the DRF curriculum to update the DRF course descriptions and provide a Certificate of Proficiency in drafting and an AAS DRF degree tract specialization. Heavy Equipment classes will be re-evaluated to meet the needs of the CON Program. Phase Two will also modify the prerequisites of three welding courses with the intent of having them as elective for construction students. Additionally, phase two will modify two Speech, Theatre, and Film classes to have them available as electives for CON students.

Phase Three will be evaluated in the 2013 and 2014 academic years by the Construction Department Chair, Construction Advisory Council, CTE Dean and Instructional Council. This third phase aims to have/finalize a course articulation agreement with NAU and ASU for those students that wish to attain a four year construction Management degree (or similar degree at ASU). Depending upon enrollment and demand projection for the CON program to create a more management oriented tract for students to complete four year construction management degrees we will evaluate the feasibility of an Associate of Science Degree. The degree will have some direct to employment skills in the event students do not pursue or finish their four year degree.

Existing Students Considerations

There are still some BOC (BOC is the existing alpha identifier for construction classes in the NPC college catalog) classes being taught in dual enrollment at area high schools and the likelihood of BOC or existing construction class students wanted to finish their two year degree, we will develop an Associate of General Studies degree (or course equivalency matrix) tract for our students that have taken BOC course prior to the creation of the CON Program at NPC. The new CON Program's AAS degree tract will accept two non-restricted electives from the BOC curriculum or any other 100 level coursework to provide some flexibility for our new and existing students. The Associate of General Studies tract and acceptance of any two 100 level three credit college courses or greater for the CON program's AAS degree tract will be re-evaluated every year for the first three years to determine usefulness and effectiveness.

The CON Program seeks to achieve 3 degree tracts:

AAS: Construction Technology (2013)

AGS: Construction Skills

AS: Construction Management to AS (2014)

The CON Program will have two Certificate of Proficiencies and a Certificate of Applied Science:

CP: Construction Technology (2013)

CAS: Construction Technology (2013)

CP: Drafting (2013)

By providing our students with three degree tracts, two Certificates of Proficiency, and a Certificate of Applied Science we ultimately hope to meet the need for professional constructors in the White Mountain Community. The construction program will seek accreditation through National Center for Construction Education and Research.

Phase 1 Create: CP, CAS, and AAS for Construction Technology (Completed by 2012)

National Center for Construction Education and Research (NCCER)
Certification

CON 100	Intro to Construction	2
CON 110	Plan Reading, Com., Site Layout, and Employment	3
CON 124	Masonry System	3
CON 125	Concrete System	3
CON126	Framing Systems	4
CON 145	Roofing, Thermal, and Moisture Protection Systems	3
CON 227	Electrical, Mechanical, and Plumbing Systems	3

Construction Core College Curriculum

CON 105	Engineering Principles & Construction Methods	3
CON 140	Construction Computer Applications	3
CON 263	Estimating, Planning, and Scheduling	3
CON 200	Integrated Design/Management Project	4
CON 230	Sustainable Construction	3

CON Electives

CON 241	Electrical 1	3
CON 242	Electrical 2	3
CON 245	Alternative Energy	3
CON 223	Heavy Highway Construction	3
CON 250	Construction Internship	1 to 6
CON 252	Construction Service Learning	1 to 3

Phase 2 Modify: Drafting classes, Modify Welding for Prerequisites, Modify two Speech, Theatre, and Film classes, Modify HQO classes, and CP in Drafting (Completed by 2012)

Drafting (DRF)

DRF 120	Technical Drafting	3
DRF 130	Architecture I	3
DRF 150	CAD I	3
DRF 200	Integrated Design/Management Project	4
DRF 230	Architecture II	3
DRF 250	CAD II Project	3

Welding Electives Modification (WLD)

WLD 151	Cutting process & Weld Quality	3
WLD 152	SMAW Plate I	3
WLD 154	GMAW Plate	3

Speech, Theatre, and Film

SPT 220	Technical Theatre	3
---------	-------------------	---

Heavy Equipment

HQO 105	Basic Operation Techniques and Equipment	3
HQO180	Intermediate Operation Techniques and Equipment	3
HQO220	Advanced Operation Techniques and Equipment	2
	CON and HQO Electives	
HQO123	Estimating for Heavy Civil and MSHA	3
HQO232	Finish Grading and Soil	3

Phase 3 CON AS Degree Core (Future Completion/Submission Based Upon Demand)

CON 106	Construction Methods	3
CON 145	Codes and Standards	3
CON 224	Masonry	3
CON 225	Concrete	3
CON 230	Sustainable Construction Methods	3
CON 253	Building Layout	3
CON 255	Project Supervision 1	3
CON 256	Project Supervision 2	3
CON 260	Soils Mechanics	3
CON 200	Integrated Design/Management Project	4
CON 226	Heavy Highway Construction	3
CON 250	Construction Internship	3
	Humanities Elective (open to all):	
CON 120	<i>Building Human Environment</i>	3

= modification

8. FINANCIAL PROJECTIONS

Staffing Expenses

Staffing for the CON Program will likely need one full time faculty/chair position and one faculty positions costing around \$ 140,000.00 per year in salary expenses at a burdened⁸ rate for both employees. The department chair fulltime faculty position is currently filled and we have identified several possible faculty candidates to fill the other position. Contractors and other skilled adjunct faculty personnel will likely be interested in being involved in this position since the construction economy has been sluggish the last several years. This makes the total staffing expenses for the program approximately \$ 140,000.00 in annual salary costs including benefits and other employment related expenses.

1. Faculty Member - \$65,000.00
2. Adjunct Costs - \$10,000.00
3. Additional Faculty - \$65,000.00
 - a. Subtotal – \$140,000.00

Operating Expenses

The program will likely need \$7,000.00 and \$ 10,000.00 in instructional supplies for consumable materials used in lab instruction; wood, concrete, electrical supplies, paper, etc.

⁸ Burdened rates include benefits

In-state travel will also require about \$1,000.00 in transportation and meals to visit other facilities and events to enhance instructional opportunities in the classroom.

Completion in Skills USA providing opportunities for our best students to compare and share their skills with the state of Arizona and beyond will require around \$2,000.00 dollars in funding. The participation in this event could increase our students exposure to potential sources of scholarships through Skills USA, the Associated General Contractors of Arizona, National Association of Women in Construction and other industry groups that provides scholarships specific to construction students.

Marketing and Advertising will also require a budget of around \$1,000.00 to ensure the word is being spread about our program to those interested in construction and how to improve their skills.

4. Operating expenses -	\$10,000.00
5. In-state travel -	\$1,000.00
6. Competing in Skills USA -	\$2,000.00
7. Marketing and Advertising -	\$1,000.00
8. Annual maintenance cost -	\$20,000.00
9. Skills center operational costs	\$15,000.00
a. <u>Subtotal-</u>	<u>\$49,000.00</u>
i. <u>Total</u>	<u>189,000.00</u>

Total Operating Expenses for the CON Programs⁹

The Total Operating Expenses for the CON Programs will be about \$190,000.00 annually.

Indirect Costs

The additional overhead costs incurred by the college at approximately 15% of our budget for the program may be as high as \$30,000.00 dollars to the college in additional demands for student support services. Currently plans to build the new skills center for the program are underway and in the design/bidding phase of the construction process. The new skills center should alleviate some the increased demands on parking

Capital Expenditures

Since this is a new program we anticipate the need for around \$130,000.00 to \$150,000.00 in new equipment for the program. This will likely include a state of the art shop equipment concrete mixers, saws, drills, and other equipment with safety features that reduce the likely of cutting or injuring a student/instructor. Computer numeric controlled routers to create designs in wood and their media. Additionally, we may purchase several pieces of simulation equipment designed to train students on the operation of equipment commonly used in the construction or mining industries. Most of this equipment should last around ten years before it is replaced.

⁹ This does not include facilities

Total Program Expenses

With an annual revenue estimate of \$96,000.00 and an annual expense of \$150,000.00 we will cost the college around \$90,000.00 in expenses to operate and maintain our program (\$96,000.00 – \$190,000.00 = - \$94,000.00) in the initial couple years. The intent is to be self-sustaining after the first several years of the CON programs inception.

9. FINDINGS AND RECOMMENDATIONS

Designing a nationally certified CON program with the appropriate credentials is the best way to provide our students with a well-rounded education and good employments prospects. Doing so will meet our local needs for skilled construction workers as the local economy recovers from the housing surplus and market downturn. Without the adequate training, credentials, and a solid foundation in technology our students will flounder when competing against intuitions and firms providing their students with such credentials. By creating a certification based on nationally accredited curriculum NPC will create, support, and promote lifelong learners by instilling basic life skills of the building trades and trade management skills required to create effective constructors in our community as well as nationally.

Approved

Appendix A

Survey from Community members

See accompanying form

Approved

Appendix B

Bureau of Labor and Statistics Data for Construction

See accompanying form

Approved

CON Feasibility Study - Appendix A - 11-26-12

Final Version

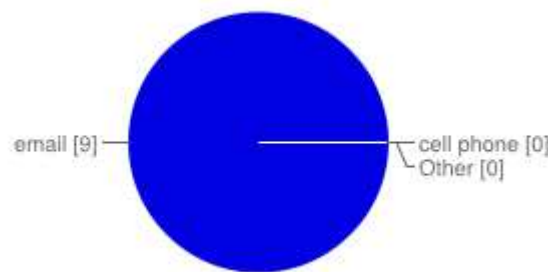
9 responses

Summary [See complete responses](#)

Please type your name?

Todd Turley Joe Costion Chuck Marsh Jennifer McDowell Steve Sims Gary Townsley Homero Vela Jason Carter Mike Marr

Please type your preferred method of contact (email, office phone, or cell phone)?



email	9	100%
cell phone	0	0%
Other	0	0%

Please provide us with your contact information (email, office phone, cell phone...).

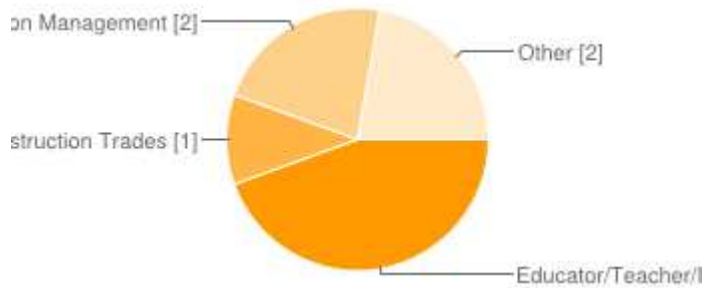
todd@wusd1.org jcostion@gmail.com chuckm@show-low.k12.az.us jennifer.mcdowell@npc.edu steve@creativegreenhomesllc.com gtownsley@azbuilders.org ;office 602.274.8222 homero.vela@navajocountyaz.gov 928-537- ...

Please state your current job title?

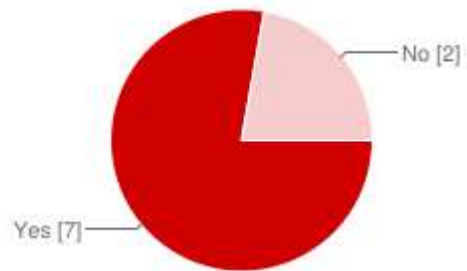
Teacher Consultant Construction Technology Teacher, Show Low High School Apache County Coordinator Owner Apprenticeship Director Director of Public Works Vice President/CEO Senior Project Manager/Pre Const ...

Select the nature of your employment:

Educator/Teacher/Instructor	4	44%
Construction Trades	1	11%
Construction Management	2	22%
Other	2	22%

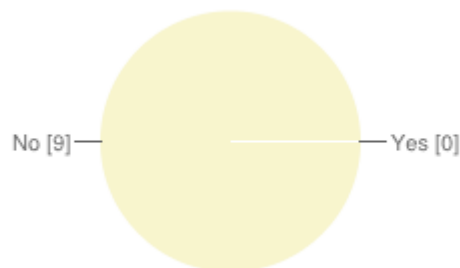


Do you own (or are employed by) business/organization operating within the Northern AZ?



Yes	7	78%
No	2	22%

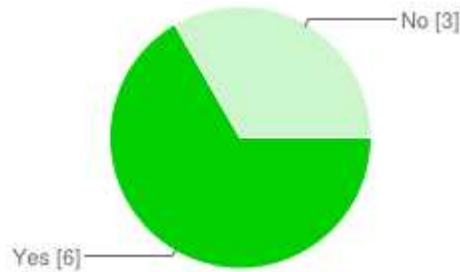
Do you own (or are employed by) business/organization operating outside the state of AZ?



Yes	0	0%
No	9	100%

Do you own (or are employed by) a construction related business?

Yes	6	67%
No	3	33%



List the state in which your business/organization operates if other than AZ:

n/a AZ New Mexico, Utah

Construction Curricula Feedback

Please provide your input own construction curriculum.

Do you see a value in creating construction related training programs?



Briefly explain the skillset you look for or find of value in students studying construction?

Experience and basic safety Trade related skills " Carpentry Electrical Masonry Plumbing Safety Blue Print
 Reading Depending on the objective of the program: The outcome could be general to the construction industry, leading to a management type of certificate or degree. Or, could be trade specific leading to a certificate in a particular trade.
 Either way there should be some form of certification as an end result. It is a difficult career to sustain but construction services are always needed so there is a level of job security that you do not see in other fields. I also firmly believe that
 a ...

Would you be willing offer support to NPC construction related students?



How would you be willing offer support to NPC construction students?

counseling, teaching Teach Sustainble / Green Building Fundamentals Several Classes available I am a construction technology teacher at Show Low High School. We offer certification through NCCER. I would be willing to support the program completely and to offer whatever services may be needed in Apache County. I will also be willing to sit on the advisory board and to provide constant feedback about the effectiveness of the program. Not sure yet. Perhaps opening up my jobsites for tours? Possibly... visit the class from time to time? Apprenticeship Training and job opprotunities in the Phoeni ...

What emerging skills do you see vital to a construction student/constructor possessing?

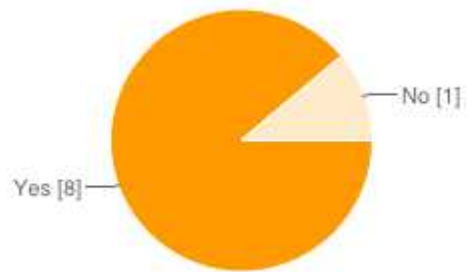
In the past few years a lot of emphasis was in the management side and in using computers to do many tedious tasks. Somehow we have forgotten the tradesman that understands how to get the work done. Photo Voltaic training & installs BPI Weatherization & Energy Auditing Leadership skills and potential are important. Also a look into the "green" and "sustainable" fields will become more and more important. Customer Service Skills especially if they want to make a career out of construction. I also feel that initiative and following through with projects is crucial. Being honest and working ...

Please identify any construction related training needs you feel would strengthen our community?

We may not have a lot of management aptitudes, but we have a lot of workers that are skilled or could become skilled in the trades. Photo Voltaic training & installs BPI Weatherization & Energy Auditing I think addressing the 21st century construction ideas and methods as well as traditionl methods will help. I think that promoting more of a certified approach to the building trades in our area would rais the level of craftsmanship in our area. customer service training planning and zoning OSHA county and state regulations safety and first aid Tons, see above Any hands-on and technical trainin ...

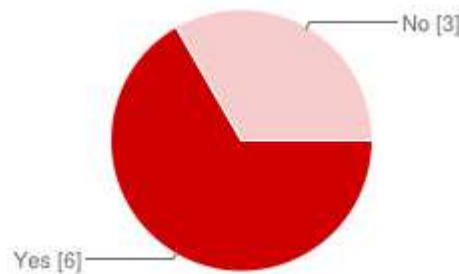
Professional Development Needs

Are you currently interested in construction related professional development programs?



Yes	8	89%
No	1	11%

Do you have an interest or need in attending (or sending attendees) to a professional development construction related course?



Yes	6	67%
No	3	33%

What type of construction related professional development training would you be interested in personally?

Estimating, print reading, updating common trade practices BPI Personally, I am interested in some of the new "green" technologies. (to apply at an educational level as well as personally) Customer Service Accounting Running a small business Open to discuss None. We currently offer several supervisory training programs to our association member contractors. Developing highly efficient goal driven work teams Marketing None

What type of construction related professional development training would you be interested in seeing provided to your community?

trade skill development BPI Certs I think that our "non-building" community would appreciate seeing the college offer "mini" courses on maintenance issues related to owning a house. I also would like to see NPC support a "construction career day" targeting some of the potential students we have in our area. All of the above Open to discuss I really dont know the needs of the white mountain area. Management Training that leads to increased productivity, safety, and teamwork. OSHA/Safety Construction Accounting Estimating Project Management Marketing Human Resources Not sure

Additional Feedback

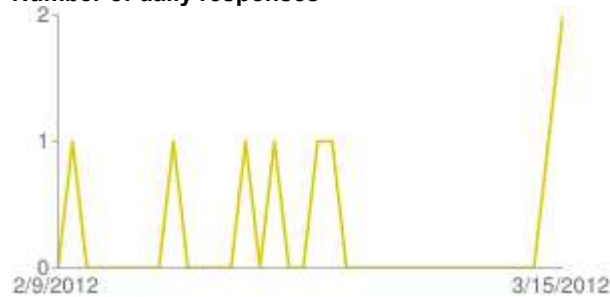
Please Provide additional comments you feel relevant to the questions above .

||| I look forward to a Construction Program being implemented and would really like to see it in Apache County. It is a skill set that everyone should be aware of and be able to sustain for themselves and for their families. Open to discuss ||||

Any other thoughts or comments?

| As a "dual enrollment" teacher at Show Low High School, I am very interested in seeing NPC continue their offerings in the building trades areas. As well as honoring the credits already in progress at the high school level. Let me know if I can do anything to help! Open to discuss ||||

Number of daily responses





NEWS RELEASE



For release 10:00 a.m. (EST) Wednesday, February 1, 2012

USDL-12-0160

Technical information: (202) 691-5700 • ep-info@bls.gov • www.bls.gov/emp

Media contact: (202) 691-5902 • PressOffice@bls.gov

EMPLOYMENT PROJECTIONS – 2010-20

Industries and occupations related to health care, personal care and social assistance, and construction are projected to have the fastest job growth between 2010 and 2020, the U.S. Bureau of Labor Statistics reported today. Total employment is projected to grow by 14.3 percent over the decade, resulting in 20.5 million new jobs. Despite rapid projected growth, construction is not expected to regain all of the jobs lost during the 2007-09 recession.

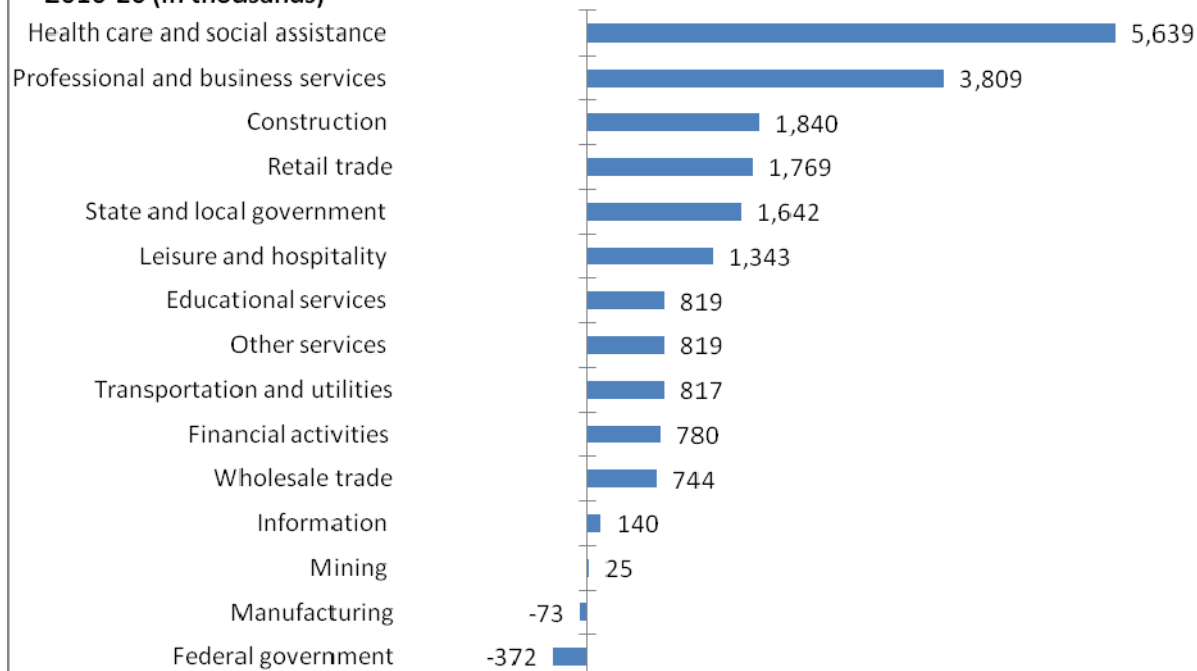
The 2010-20 projections incorporate a new BLS system that depicts education, training, and related work experience typically needed for occupations. In occupations in which a master's degree is typically needed for entry, employment is expected to grow by 21.7 percent, faster than the growth rate for any other education category. In occupations in which apprenticeship is the typical on-the-job training, employment is expected to grow by 22.5 percent, faster than for any other on-the-job training category.

This news release focuses on five areas: labor force and the macroeconomy, industry employment, occupational employment, education and training, and replacement needs.

Labor force and the macroeconomy

- Slower population growth and a decreasing overall labor force participation rate are expected to lead to slower civilian labor force growth from 2010 to 2020: 0.7 percent annually, compared with 0.8 percent for 2000-10, and 1.3 percent for 1990-2000. The projected 0.7 percent growth rate will lead to a civilian labor force increase of 10.5 million by 2020. (See table 1.)
- The baby-boom generation moves entirely into the 55-years-and-older age group by 2020, increasing that age group's share of the labor force from 19.5 percent in 2010 to 25.2 percent in 2020. The "prime-age" working group (ages 25 to 54) is projected to drop to 63.7 percent of the 2020 labor force. The 16- to 24-year-old age group is projected to account for 11.2 percent of the labor force in 2020. (See table 1.)
- By 2020, the number of Hispanics in the labor force is projected to grow by 7.7 million, or 34.0 percent, and their share of the labor force is expected to increase from 14.8 percent in 2010 to 18.6 percent in 2020. The labor force shares for Asians and blacks are projected to be 5.7 and 12.0 percent, respectively, up slightly from 4.7 and 11.6 percent in 2010. (See table 1.)
- Gross domestic product (GDP) is projected to grow by 3.0 percent annually, consistent with slow labor force growth, the assumption of a full-employment economy in 2020, and labor productivity growth of 2.0 percent annually.

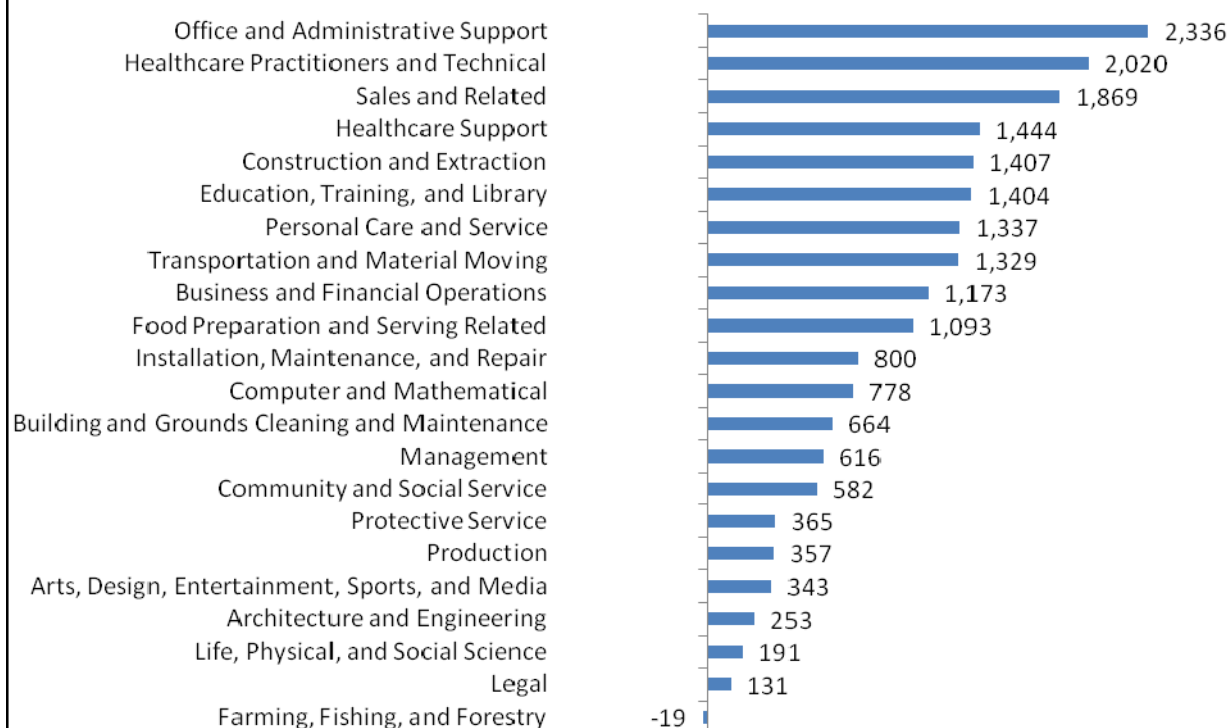
Chart 1. Projected change in nonagriculture wage and salary employment by major industry, 2010-20 (in thousands)



Industry employment

- Nonagriculture wage and salary employment, which accounts for more than 9 in 10 jobs in the economy, is projected to expand to 150.2 million by 2020, up from 130.4 million in 2010. (See table 2.)
- The health care and social assistance sector is projected to gain the most jobs (5.6 million), followed by professional and business services (3.8 million), and construction (1.8 million). Despite rapid growth in the construction sector, employment in 2020 is not expected to reach its pre-recessionary annual average peak of 7.7 million in 2006. (See table 2 and chart 1.)
- About 5.0 million new jobs—25 percent of all new jobs—are expected in the three detailed industries projected to add the most jobs: construction, retail trade, and offices of health practitioners. Seven of the 20 industries gaining the most jobs are in the health care and social assistance sector, and five are in the professional and business services sector. (See table 3.)
- The 20 detailed industries projected to lose the largest numbers of jobs are primarily in the manufacturing sector (11 industries) and the federal government (3 industries). The largest job losses are projected for the Postal Service (-182,000), federal non-defense government (-122,000), and apparel knitting mills (-92,000). (See table 4.)

Chart 2. Projected employment change by major occupational group, 2010-20 (in thousands)



Occupational employment

- Of the 22 major occupational groups, employment in healthcare support occupations is expected to grow most rapidly (34.5 percent), followed by personal care and services occupations (26.8 percent), and healthcare practitioners and technical occupations (25.9 percent). However, the office and administrative support occupations group, with projected slower than average growth of 10.3 percent, is expected to add the largest number of new jobs (2.3 million). (See table 5 and chart 2.)
- The four detailed occupations expected to add the most employment are registered nurses (712,000), retail salespersons (707,000), home health aides (706,000), and personal care aides (607,000). All have large employment in 2010 and are expected to grow faster than the average of 14.3 percent. (See table 6.)
- One-third of the projected fastest growing occupations are related to health care, reflecting expected increases in demand as the population ages and the health care and social assistance industry grows. (See table 7.)
- More than one-fourth of the projected fastest growing occupations are related to construction. Employment in most of these occupations, still at low levels in 2010 because of the 2007-09 recession, will recover along with the construction industry. But employment in most construction occupations is not expected to reach pre-recession levels. (See table 7.)
- Production occupations and office and administrative support occupations dominate the list of detailed occupations with the largest projected employment declines. However, farmers,

ranchers, and other agricultural managers top the list, with a projected loss of 96,100 jobs. (See table 8.)

Education and training

- Occupations that typically need some type of postsecondary education for entry are projected to grow the fastest during the 2010-20 decade. Occupations classified as needing a master's degree are projected to grow by 21.7 percent, followed by doctoral or professional degree occupations at 19.9 percent, and associate's degree occupations at 18.0 percent. (See table 9.)
- In terms of typical on-the-job training, occupations that typically require apprenticeships are projected to grow the fastest (22.5 percent). (See table 9.)
- Of the 30 detailed occupations projected to have the fastest employment growth, 17 typically need some type of postsecondary education for entry into the occupation. (See table 7.)
- Two-thirds of the 30 occupations projected to have the largest number of new jobs typically require less than a postsecondary education, no related work experience, and short- or moderate-term on-the-job training. (See table 6.)
- Only 3 of the 30 detailed occupations projected to have the largest employment declines are classified as needing postsecondary education for entry. (See table 8.)

Replacement needs

- Over the 2010-20 decade, 54.8 million total job openings are expected. (See table 9.) While growth will lead to many openings, more than half—61.6 percent—will come from the need to replace workers who retire or otherwise permanently leave an occupation.
- In 4 out of 5 occupations, openings due to replacement needs exceed the number due to growth. Replacement needs are expected in every occupation, even in those that are declining.
- More than two-thirds of all job openings are expected to be in occupations that typically do not need postsecondary education for entry. (See table 9.)
- Eighteen of the 30 occupations with the largest number of projected total job openings are classified as typically needing less than a postsecondary education and needing short-term on-the-job training. (See table 10.)

Interpreting the projections in light of the 2007-09 recession and recovery

The BLS projections are built on the assumption of a full employment economy in 2020. The 2007-09 recession represented a sharp downturn in the economy—and the economy, especially the labor market, has been slow to recover. As a result, the 2010-20 projections reach a robust 2020 target year largely because the 2010 base year began from a relatively low point. Rapid growth rates for some measures reflect recovery from the recession and, with some important exceptions, growth beyond recovery.

A note about labor shortages and surpluses in the context of long-term economic projections

Users of these data should not assume that the difference between the projected increase in the labor force and the projected increase in employment implies a labor shortage or surplus. The BLS projections assume labor market equilibrium, that is, one in which labor supply meets labor demand except for some degree of frictional unemployment. In addition, the employment and labor force measures use different concepts. Employment is a count of jobs, and one person may hold more than one job. Labor force is a count of people, and a person is counted only once regardless of how many jobs he or she holds. For a discussion of the basic projections methodology, see “Overview of projections to 2020,” Dixie Sommers and James C. Franklin, January 2012 issue of the *Monthly Labor Review*.

More information

The BLS projections are used by high school students and their teachers and parents, college students, career changers, and career development and guidance specialists. The projections are the foundation of the BLS *Occupational Outlook Handbook*, the nation’s most widely used career information resource. The projections also are used by state workforce agencies to prepare state and area projections that, together with the national projections, are widely used by policymakers and education and training officials to make decisions about education and training policy, funding, and program offerings. In addition, other federal agencies, researchers, and academics use the projections to understand trends in the economy and labor market. The projections are updated every two years.

More detailed information on the 2010-20 projections appears in five articles in the January 2012 issue of the *Monthly Labor Review*, published by the Bureau of Labor Statistics, U.S. Department of Labor. The *Monthly Labor Review* is available online at www.bls.gov/opub/mlr/mlrhome.htm.

The 2012-13 edition of the *Occupational Outlook Handbook* will feature the 2010-20 projections in assessing job outlook, work activities, wages, education and training requirements, and more for detailed occupations in 341 profiles. The updated *Handbook* will be available online in late March 2012, at www.bls.gov/ooh. A graphic representation of the highlights of the projections appears in the Winter 2011-12 issue of the *Occupational Outlook Quarterly*, available online at www.bls.gov/ooq.

Tables with detailed, comprehensive statistics used in preparing the projections are available online at www.bls.gov/emp/tables.htm, and projections methodology are accessible at www.bls.gov/emp/ep_projections_methods.htm.

Information from this release will be made available to sensory impaired individuals upon request. Voice phone: (202) 691-5200; Federal Relay Services: 1 (800) 877-8339.

Table 1. Civilian labor force, by age, sex, race, and ethnicity, 1990, 2000, 2010, and projected 2020
(In thousands)

Age, sex, race, and ethnicity	Levels				Change			Percent change			Percent distribution				Annual growth rate (percent)		
	1990	2000	2010	2020	1990-2000	2000-10	2010-20	1990-2000	2000-10	2010-20	1990	2000	2010	2020	1990-2000	2000-10	2010-20
Total, 16 years and older	125,840	142,583	153,889	164,360	16,743	11,306	10,471	13.3	7.9	6.8	100.0	100.0	100.0	100.0	1.3	0.8	0.7
Age, years:																	
16 to 24	22,492	22,520	20,934	18,330	28	-1,586	-2,604	0.1	-7.0	-12.4	17.9	15.8	13.6	11.2	0.0	-0.7	-1.3
25 to 54	88,322	101,394	102,940	104,619	13,072	1,546	1,679	14.8	1.5	1.6	70.2	71.1	66.9	63.7	1.4	0.2	0.2
55 and older	15,026	18,669	30,014	41,411	3,643	11,345	11,397	24.2	60.8	38.0	11.9	13.1	19.5	25.2	2.2	4.9	3.3
Sex:																	
Men	69,011	76,280	81,985	87,128	7,269	5,705	5,143	10.5	7.5	6.3	54.8	53.5	53.3	53.0	1.0	0.7	0.6
Women	56,829	66,303	71,904	77,232	9,474	5,601	5,328	16.7	8.4	7.4	45.2	46.5	46.7	47.0	1.6	0.8	0.7
Race:																	
White	107,447	118,545	125,084	130,516	11,098	6,539	5,432	10.3	5.5	4.3	85.4	83.1	81.3	79.4	1.0	0.5	0.4
Black	13,740	16,397	17,862	19,676	2,657	1,465	1,814	19.3	8.9	10.2	10.9	11.5	11.6	12.0	1.8	0.9	1.0
Asian	4,653	6,270	7,248	9,430	1,617	978	2,182	34.8	15.6	30.1	3.7	4.4	4.7	5.7	3.0	1.5	2.7
All other groups ¹	-	1,371	3,694	4,738	-	2,323	1,044	-	-	28.3	-	1.0	2.4	2.9	-	-	2.5
Ethnicity:																	
Hispanic origin	10,720	16,689	22,748	30,493	5,969	6,059	7,745	55.7	36.3	34.0	8.5	11.7	14.8	18.6	4.5	3.1	3.0
Other than Hispanic origin	115,120	125,894	131,141	133,867	10,774	5,247	2,726	9.4	4.2	2.1	91.5	88.3	85.2	81.4	0.9	0.4	0.2
White non-Hispanic	97,818	102,729	103,947	102,371	4,911	1,218	-1,576	5.0	1.2	-1.5	77.7	72.0	67.5	62.3	0.5	0.1	-0.2
Age of baby boomers	26 to 44	36 to 54	46 to 64	56 to 74													

¹ The "all other groups" category includes (1) those classified as being of multiple racial origin and (2) the race categories of (2a) American Indian and Alaska Native and (2b) Native Hawaiian and Other Pacific Islanders. Dash indicates no data collected for category. Details may not sum to totals because of rounding.

Table 2. Employment by major industry sector, 2000, 2010, and projected 2020

(In thousands)

Industry Sector	Employment			Change		Percent Distribution			Annual Growth Rate (percent)	
	2000	2010	2020	2000-10	2010-20	2000	2010	2020	2000-10	2010-20
Total ¹	146,236.0	143,068.2	163,537.1	-3,167.8	20,468.9	100.0	100.0	100.0	-0.2	1.3
Nonagriculture wage and salary ²	132,425.0	130,435.6	150,176.8	-1,989.4	19,741.2	90.6	91.2	91.8	-0.2	1.4
Goods-producing, excluding agriculture	24,569.7	17,705.5	19,496.8	-6,864.2	1,791.3	16.8	12.4	11.9	-3.2	1.0
Mining	520.4	655.9	680.7	135.5	24.8	0.4	0.5	0.4	2.3	0.4
Construction	6,786.4	5,525.6	7,365.1	-1,260.8	1,839.5	4.6	3.9	4.5	-2.0	2.9
Manufacturing	17,262.9	11,524.0	11,450.9	-5,738.9	-73.1	11.8	8.1	7.0	-4.0	-0.1
Services-providing	107,855.3	112,730.1	130,680.1	4,874.8	17,950.0	73.8	78.8	79.9	0.4	1.5
Utilities	601.3	551.8	516.1	-49.5	-35.7	0.4	0.4	0.3	-0.9	-0.7
Wholesale trade	5,933.5	5,456.1	6,200.2	-477.4	744.1	4.1	3.8	3.8	-0.8	1.3
Retail trade	15,279.8	14,413.7	16,182.2	-866.1	1,768.5	10.4	10.1	9.9	-0.6	1.2
Transportation and warehousing	4,410.3	4,183.3	5,036.2	-227.0	852.9	3.0	2.9	3.1	-0.5	1.9
Information	3,630.6	2,710.9	2,851.2	-919.7	140.3	2.5	1.9	1.7	-2.9	0.5
Financial activities	7,687.5	7,630.2	8,410.6	-57.3	780.4	5.3	5.3	5.1	-0.1	1.0
Professional and business services	16,666.1	16,688.0	20,497.0	21.9	3,809.0	11.4	11.7	12.5	0.0	2.1
Educational services	2,390.6	3,149.6	3,968.8	759.0	819.2	1.6	2.2	2.4	2.8	2.3
Health care and social assistance	12,718.3	16,414.5	22,053.9	3,696.2	5,639.4	8.7	11.5	13.5	2.6	3.0
Leisure and hospitality	11,861.6	13,019.6	14,362.3	1,158.0	1,342.7	8.1	9.1	8.8	0.9	1.0
Other services	5,885.7	6,031.3	6,850.7	145.6	819.4	4.0	4.2	4.2	0.2	1.3
Federal government	2,865.0	2,968.0	2,596.0	103.0	-372.0	2.0	2.1	1.6	0.4	-1.3
State and local government	17,925.0	19,513.1	21,154.8	1,588.1	1,641.7	12.3	13.6	12.9	0.9	0.8
Agriculture, forestry, fishing, and hunting ³	2,396.2	2,135.5	2,005.3	-260.7	-130.2	1.6	1.5	1.2	-1.1	-0.6
Agriculture wage and salary	1,354.0	1,282.1	1,236.1	-71.9	-46.0	0.9	0.9	0.8	-0.5	-0.4
Agriculture self-employed and unpaid family workers	1,042.2	853.4	769.3	-188.8	-84.1	0.7	0.6	0.5	-2.0	-1.0
Nonagriculture self-employed and unpaid family worker	9,313.7	8,943.8	9,720.6	-369.9	776.8	6.4	6.3	5.9	-0.4	0.8
Secondary wage and salary jobs in agriculture and private household industries ^(4, 5)	141.7	111.6	112.7	-30.1	1.1	0.1	0.1	0.1	-2.4	0.1
Secondary jobs as a self-employed or unpaid family worker ^(4, 6)	1,959.4	1,441.7	1,521.7	-517.7	80.0	1.3	1.0	0.9	-3.0	0.5

¹ Employment data for wage and salary workers are from the BLS Current Employment Statistics survey, which counts jobs, whereas self-employed, unpaid family workers, and agriculture, forestry, fishing, and hunting are from the Current Population Survey (household survey), which counts workers.

² Includes wage and salary data from the Current Employment Statistics survey, except private households, which is from the Current Population Survey. Logging workers are excluded.

³ Includes agriculture, forestry, fishing, and hunting data from the Current Population Survey, except logging, which is from Current Employment Statistics survey. Government wage and salary workers are excluded.

⁴ Due to methodological changes, these data are not comparable to previously published numbers for these categories of secondary workers.

⁵ Workers who hold a secondary wage and salary job in agricultural production, forestry, fishing, and private household industries.

⁶ Wage and salary workers who hold a secondary job as a self-employed or unpaid family worker.

Table 3. The 20 industries with the largest projected wage and salary employment growth, 2010-20

(In thousands)

Industry Code ¹	Industry Description	Sector	Employment		Change, 2010-20	Annual Growth Rate (percent), 2010-20
			2010	2020		
23	Construction	Construction	5,525.6	7,365.1	1,839.5	2.9
44, 45	Retail trade	Retail trade	14,413.7	16,182.2	1,768.5	1.2
6211, 6212, 6213	Offices of health practitioners	Health care and social assistance	3,818.2	5,209.6	1,391.4	3.2
622	Hospitals	Health care and social assistance	4,685.3	5,563.6	878.3	1.7
6216	Home health care services	Health care and social assistance	1,080.6	1,952.4	871.8	6.1
722	Food services and drinking places	Leisure and hospitality	9,351.8	10,212.2	860.4	0.9
6241	Individual and family services	Health care and social assistance	1,215.0	2,066.4	851.4	5.5
623	Nursing and residential care facilities	Health care and social assistance	3,129.0	3,951.0	822.0	2.4
42	Wholesale trade	Wholesale trade	5,456.1	6,200.2	744.1	1.3
NA	General Local government educational services compensation	State and local government	8,010.4	8,751.4	741.0	0.9
5415	Computer systems design and related services	Professional and business services	1,441.5	2,112.8	671.3	3.9
5613	Employment services	Professional and business services	2,716.7	3,348.0	631.3	2.1
5416	Management, scientific, and technical consulting services	Professional and business services	991.4	1,567.0	575.6	4.7
6112, 6113	Junior colleges, colleges, universities, and professional schools	Educational services	1,694.0	2,171.1	477.1	2.5
6214, 6215, 6219	Outpatient, laboratory, and other ambulatory care services	Health care and social assistance	1,077.1	1,471.2	394.1	3.2
5413	Architectural, engineering, and related services	Professional and business services	1,276.6	1,635.1	358.5	2.5
5617	Services to buildings and dwellings	Professional and business services	1,742.5	2,044.8	302.3	1.6
484	Truck transportation	Transportation and Warehousing	1,244.0	1,544.0	300.0	2.2
NA	General State government educational services compensation	State and local government	2,377.1	2,661.7	284.6	1.1
6244	Child day care services	Health care and social assistance	851.8	1,101.3	249.5	2.6

¹ As defined by the 2007 North American Industrial Classification System codes (NAICS).

Table 4. The 20 industries with the largest projected wage and salary employment declines, 2010-20

(In thousands)

Industry Code ¹	Industry Description	Sector	Employment		Change, 2010-20	Annual Growth Rate (percent), 2010-20
			2010	2020		
491	Postal Service	Federal government	656.4	474.6	-181.8	-3.2
NA	General federal non-defense government compensation	Federal government	1667.5	1545.7	-121.8	-0.8
3151	Apparel knitting mills	Manufacturing	157.7	66.1	-91.6	-8.3
5111	Newspaper, periodical, book, and directory publishers	Information	501.3	439.7	-61.6	-1.3
3399	Other miscellaneous manufacturing	Manufacturing	266.0	210.3	-55.7	-2.3
NA	General Federal defense government compensation	Federal government	545.5	496.0	-49.5	-0.9
3341	Computer and peripheral equipment manufacturing	Manufacturing	161.6	117.5	-44.1	-3.1
3345	Navigational, measuring, electromedical, and control instruments manufacturing	Manufacturing	406.0	363.2	-42.8	-1.1
111	Crop production	Agriculture, forestry, fishing and hunting	629.5	589.3	-40.2	-0.7
8123	Drycleaning and laundry services	Other services	302.1	265.7	-36.4	-1.3
2211	Electric power generation, transmission and distribution	Utilities	396.9	361.4	-35.5	-0.9
NA	State government enterprises	State and local government	517.8	484.6	-33.2	-0.7
3344	Semiconductor and other electronic component manufacturing	Manufacturing	369.7	336.9	-32.8	-0.9
3342	Communications equipment manufacturing	Manufacturing	118.0	85.7	-32.3	-3.1
323	Printing and related support activities	Manufacturing	486.9	454.7	-32.2	-0.7
3131	Fiber, yarn, and thread mills	Manufacturing	237.8	206.1	-31.7	-1.4
512	Motion picture, video, and sound recording industries	Information	372.0	347.0	-25.0	-0.7
3335	Metalworking machinery manufacturing	Manufacturing	153.2	130.5	-22.7	-1.6
3251	Basic chemical manufacturing	Manufacturing	142.4	121.6	-20.8	-1.6
3363	Motor vehicle parts manufacturing	Manufacturing	415.1	394.9	-20.2	-0.5

¹ As defined by the 2007 North American Industrial Classification System codes (NAICS).

Table 5: Employment by major occupational group, 2010 and projected 2020, and median annual wage, May 2010
(In thousands)

2010 National Employment Matrix title and code		Employment		Change, 2010-20		Median annual wage, May 2010
		2010	2020	Number	Percent	
00-0000	Total, All Occupations	143,068.2	163,537.1	20,468.9	14.3	\$33,840
31-0000	Healthcare Support Occupations	4,190.0	5,633.7	1,443.7	34.5	24,760
39-0000	Personal Care and Service Occupations	4,994.7	6,331.4	1,336.6	26.8	20,640
29-0000	Healthcare Practitioners and Technical Occupations	7,799.3	9,819.0	2,019.7	25.9	58,490
21-0000	Community and Social Service Occupations	2,402.7	2,985.0	582.3	24.2	39,280
47-0000	Construction and Extraction Occupations	6,328.0	7,735.2	1,407.2	22.2	39,080
15-0000	Computer and Mathematical Occupations	3,542.8	4,321.1	778.3	22.0	73,720
13-0000	Business and Financial Operations Occupations	6,789.2	7,961.7	1,172.5	17.3	60,670
19-0000	Life, Physical, and Social Science Occupations	1,228.8	1,419.6	190.8	15.5	58,530
25-0000	Education, Training, and Library Occupations	9,193.6	10,597.3	1,403.7	15.3	45,690
53-0000	Transportation and Material Moving Occupations	9,004.8	10,333.4	1,328.7	14.8	28,400
49-0000	Installation, Maintenance, and Repair Occupations	5,428.6	6,228.7	800.2	14.7	40,120
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	2,708.5	3,051.0	342.5	12.6	42,870
41-0000	Sales and Related Occupations	14,915.6	16,784.7	1,869.1	12.5	24,370
37-0000	Building and Grounds Cleaning and Maintenance Occupations	5,498.5	6,162.5	664.0	12.1	22,490
33-0000	Protective Service Occupations	3,302.5	3,667.0	364.5	11.0	36,660
23-0000	Legal Occupations	1,211.9	1,342.9	131.0	10.8	74,580
17-0000	Architecture and Engineering Occupations	2,433.4	2,686.2	252.8	10.4	70,610
43-0000	Office and Administrative Support Occupations	22,602.5	24,938.2	2,335.7	10.3	30,710
35-0000	Food Preparation and Serving Related Occupations	11,150.3	12,242.8	1,092.5	9.8	18,770
11-0000	Management Occupations	8,776.1	9,391.9	615.8	7.0	91,440
51-0000	Production Occupations	8,594.4	8,951.2	356.8	4.2	30,330
45-0000	Farming, Fishing, and Forestry Occupations	972.1	952.6	-19.4	-2.0	19,630

Table 6. The 30 occupations with the largest projected employment growth, 2010-20
(In thousands)

Occupation	Occupational group	Employment		Change		Pre-employment		During employment
		2010	2020	Number	Percent	Typical education needed for entry ¹	Work experience in a related occupation ²	
Registered nurses	Healthcare Practitioners and Technical Occupations	2,737.4	3,449.3	711.9	26.0	Associate's degree	None	None
Retail salespersons	Sales and Related Occupations	4,261.6	4,968.4	706.8	16.6	Less than high school	None	Short-term on-the-job training
Home health aides	Healthcare Support Occupations	1,017.7	1,723.9	706.3	69.4	Less than high school	None	Short-term on-the-job training
Personal care aides	Personal Care and Service Occupations	861.0	1,468.0	607.0	70.5	Less than high school	None	Short-term on-the-job training
Office clerks, general	Office and Administrative Support Occupations	2,950.7	3,440.2	489.5	16.6	High school diploma or equivalent	None	Short-term on-the-job training
Combined food preparation and serving workers, including fast food	Food Preparation and Serving Related Occupations	2,682.1	3,080.1	398.0	14.8	Less than high school	None	Short-term on-the-job training
Customer service representatives	Office and Administrative Support Occupations	2,187.3	2,525.6	338.4	15.5	High school diploma or equivalent	None	Short-term on-the-job training
Heavy and tractor-trailer truck drivers	Transportation and Material Moving Occupations	1,604.8	1,934.9	330.1	20.6	High school diploma or equivalent	1 to 5 years	Short-term on-the-job training
Laborers and freight, stock, and material movers, hand	Transportation and Material Moving Occupations	2,068.2	2,387.3	319.1	15.4	Less than high school	None	Short-term on-the-job training
Postsecondary teachers	Education, Training, and Library Occupations	1,756.0	2,061.7	305.7	17.4	Doctoral or professional degree	None	None
Nursing aides, orderlies, and attendants	Healthcare Support Occupations	1,505.3	1,807.2	302.0	20.1	Postsecondary non-degree award	None	None
Childcare workers	Personal Care and Service Occupations	1,282.3	1,544.3	262.0	20.4	High school diploma or equivalent	None	Short-term on-the-job training
Bookkeeping, accounting, and auditing clerks	Office and Administrative Support Occupations	1,898.3	2,157.4	259.0	13.6	High school diploma or equivalent	None	Moderate-term on-the-job training
Cashiers	Sales and Related Occupations	3,362.6	3,612.8	250.2	7.4	Less than high school	None	Short-term on-the-job training
Elementary school teachers, except special education	Education, Training, and Library Occupations	1,476.5	1,725.3	248.8	16.8	Bachelor's degree	None	Internship/residency
Receptionists and information clerks	Office and Administrative Support Occupations	1,048.5	1,297.0	248.5	23.7	High school diploma or equivalent	None	Short-term on-the-job training
Janitors and cleaners, except maids and housekeeping cleaners	Building and Grounds Cleaning and Maintenance Occupations	2,310.4	2,556.8	246.4	10.7	Less than high school	None	Short-term on-the-job training
Landscaping and groundskeeping workers	Building and Grounds Cleaning and Maintenance Occupations	1,151.5	1,392.3	240.8	20.9	Less than high school	None	Short-term on-the-job training
Sales representatives, wholesale and manufacturing, except technical and scientific products	Sales and Related Occupations	1,430.0	1,653.4	223.4	15.6	High school diploma or equivalent	None	Moderate-term on-the-job training
Construction laborers	Construction and Extraction Occupations	998.8	1,211.2	212.4	21.3	Less than high school	None	Short-term on-the-job training
Medical secretaries	Office and Administrative Support Occupations	508.7	718.9	210.2	41.3	High school diploma or equivalent	None	Moderate-term on-the-job training
First-line supervisors of office and administrative support workers	Office and Administrative Support Occupations	1,424.4	1,627.8	203.4	14.3	High school diploma or equivalent	1 to 5 years	None
Carpenters	Construction and Extraction Occupations	1,001.7	1,197.6	196.0	19.6	High school diploma or equivalent	None	Apprenticeship
Waiters and waitresses	Food Preparation and Serving Related Occupations	2,260.3	2,456.2	195.9	8.7	Less than high school	None	Short-term on-the-job training
Security guards	Protective Service Occupations	1,035.7	1,230.7	195.0	18.8	High school diploma or equivalent	None	Short-term on-the-job training
Teacher assistants	Education, Training, and Library Occupations	1,288.3	1,479.3	191.1	14.8	High school diploma or equivalent	None	Short-term on-the-job training
Accountants and auditors	Business and Financial Operations Occupations	1,216.9	1,407.6	190.7	15.7	Bachelor's degree	None	None
Licensed practical and licensed vocational nurses	Healthcare Practitioners and Technical Occupations	752.3	920.8	168.5	22.4	Postsecondary non-degree award	None	None
Physicians and surgeons	Healthcare Practitioners and Technical Occupations	691.0	859.3	168.3	24.4	Doctoral or professional degree	None	Internship/residency
Medical assistants	Healthcare Support Occupations	527.6	690.4	162.9	30.9	High school diploma or equivalent	None	Moderate-term on-the-job training

¹ Represents the typical education level needed to enter the occupation.

² Indicates if work experience in a related occupation is commonly considered necessary by employers for entry, or is a commonly accepted substitute for formal types of training.

³ Indicates the typical on-the-job training needed to attain competency in the occupation.

NOTE: For more information about the education, work experience, and on-the-job training categories assigned to occupations, see www.bls.gov/emp/ep_education_training_system.htm

Table 7. The 30 occupations with the fastest projected employment growth, 2010-20
(In thousands)

Occupation	Occupational group	Employment		Change		Pre-employment		During employment
		2010	2020	Number	Percent	Typical education needed for entry ¹	Work experience in a related occupation ²	
Personal care aides	Personal Care and Service Occupations	861.0	1,468.0	607.0	70.5	Less than high school	None	Short-term on-the-job training
Home health aides	Healthcare Support Occupations	1,017.7	1,723.9	706.3	69.4	Less than high school	None	Short-term on-the-job training
Biomedical engineers	Architecture and Engineering Occupations	15.7	25.4	9.7	61.7	Bachelor's degree	None	None
Helpers--brickmasons, blockmasons, stonemasons, and tile and marble setters	Construction and Extraction Occupations	29.4	47.0	17.6	60.1	Less than high school	None	Short-term on-the-job training
Helpers--carpenters	Construction and Extraction Occupations	46.5	72.4	25.9	55.7	Less than high school	None	Short-term on-the-job training
Veterinary technologists and technicians	Healthcare Practitioners and Technical Occupations	80.2	121.9	41.7	52.0	Associate's degree	None	None
Reinforcing iron and rebar workers	Construction and Extraction Occupations	19.1	28.4	9.3	48.6	High school diploma or equivalent	None	Apprenticeship
Physical therapist assistants	Healthcare Support Occupations	67.4	98.2	30.8	45.7	Associate's degree	None	None
Helpers--pipelayers, plumbers, pipefitters, and steamfitters	Construction and Extraction Occupations	57.9	84.2	26.3	45.4	High school diploma or equivalent	None	Short-term on-the-job training
Meeting, convention, and event planners	Business and Financial Operations Occupations	71.6	102.9	31.3	43.7	Bachelor's degree	Less than 1 year	None
Diagnostic medical sonographers	Healthcare Practitioners and Technical Occupations	53.7	77.1	23.4	43.5	Associate's degree	None	None
Occupational therapy assistants	Healthcare Support Occupations	28.5	40.8	12.3	43.3	Associate's degree	None	None
Physical therapist aides	Healthcare Support Occupations	47.0	67.3	20.3	43.1	High school diploma or equivalent	None	Moderate-term on-the-job training
Glaziers	Construction and Extraction Occupations	41.9	59.6	17.7	42.4	High school diploma or equivalent	None	Apprenticeship
Interpreters and translators	Arts, Design, Entertainment, Sports, and Media Occupations	58.4	83.1	24.6	42.2	Bachelor's degree	None	Long-term on-the-job training
Medical secretaries	Office and Administrative Support Occupations	508.7	718.9	210.2	41.3	High school diploma or equivalent	None	Moderate-term on-the-job training
Market research analysts and marketing specialists	Business and Financial Operations Occupations	282.7	399.3	116.6	41.2	Bachelor's degree	None	None
Marriage and family therapists	Community and Social Service Occupations	36.0	50.8	14.8	41.2	Master's degree	None	Internship/residency
Brickmasons and blockmasons	Construction and Extraction Occupations	89.2	125.3	36.1	40.5	High school diploma or equivalent	None	Apprenticeship
Physical therapists	Healthcare Practitioners and Technical Occupations	198.6	276.0	77.4	39.0	Doctoral or professional degree	None	None
Dental hygienists	Healthcare Practitioners and Technical Occupations	181.8	250.3	68.5	37.7	Associate's degree	None	None
Bicycle repairers	Installation, Maintenance, and Repair Occupations	9.9	13.6	3.7	37.6	High school diploma or equivalent	None	Moderate-term on-the-job training
Audiologists	Healthcare Practitioners and Technical Occupations	13.0	17.8	4.8	36.8	Doctoral or professional degree	None	None
Health educators	Community and Social Service Occupations	63.4	86.6	23.2	36.5	Bachelor's degree	None	None
Stonemasons	Construction and Extraction Occupations	15.6	21.4	5.7	36.5	High school diploma or equivalent	None	Apprenticeship
Cost estimators	Business and Financial Operations Occupations	185.4	252.9	67.5	36.4	Bachelor's degree	None	None
Medical scientists, except epidemiologists	Life, Physical, and Social Science Occupations	100.0	136.5	36.4	36.4	Doctoral or professional degree	None	None
Mental health counselors	Community and Social Service Occupations	120.3	163.9	43.6	36.3	Master's degree	None	Internship/residency
Pile-driver operators	Construction and Extraction Occupations	4.1	5.6	1.5	36.0	High school diploma or equivalent	None	Moderate-term on-the-job training
Veterinarians	Healthcare Practitioners and Technical Occupations	61.4	83.4	22.0	35.9	Doctoral or professional degree	None	None

¹ Represents the typical education level needed to enter the occupation.

² Indicates if work experience in a related occupation is commonly considered necessary by employers for entry, or is a commonly accepted substitute for formal types of training.

³ Indicates the typical on-the-job training needed to attain competency in the occupation.

NOTE: For more information about the education, work experience, and on-the-job training categories assigned to occupations, see www.bls.gov/emp/ep_education_training_system.htm.

Table 8. The 30 occupations with the largest projected employment declines, 2010-20
(In thousands)

Occupation	Occupational group	Employment		Change		Pre-employment		During employment
		2010	2020	Number	Percent	Typical education needed for entry ¹	Work experience in a related occupation ²	
Farmers, ranchers, and other agricultural managers	Management Occupations	1,202.5	1,106.4	-96.1	-8.0	High school diploma or equivalent	More than 5 years	None
Postal Service mail sorters, processors, and processing machine operators	Office and Administrative Support Occupations	142.0	73.0	-68.9	-48.5	High school diploma or equivalent	None	Short-term on-the-job training
Sewing machine operators	Production Occupations	163.2	121.1	-42.1	-25.8	Less than high school	None	Short-term on-the-job training
Postal Service mail carriers	Office and Administrative Support Occupations	316.7	278.5	-38.1	-12.0	High school diploma or equivalent	None	Short-term on-the-job training
Switchboard operators, including answering service	Office and Administrative Support Occupations	142.5	109.3	-33.2	-23.3	High school diploma or equivalent	None	Short-term on-the-job training
Postal Service clerks	Office and Administrative Support Occupations	65.6	34.0	-31.6	-48.2	High school diploma or equivalent	None	Short-term on-the-job training
Cooks, fast food	Food Preparation and Serving Related Occupations	530.4	511.4	-19.1	-3.6	Less than high school	None	Short-term on-the-job training
Miscellaneous agricultural workers	Farming, Fishing, and Forestry Occupations	746.4	727.3	-19.1	-2.6	Less than high school	None	Short-term on-the-job training
Data entry keyers	Office and Administrative Support Occupations	234.7	218.8	-15.9	-6.8	High school diploma or equivalent	None	Moderate-term on-the-job training
Word processors and typists	Office and Administrative Support Occupations	115.3	102.1	-13.2	-11.5	High school diploma or equivalent	None	Short-term on-the-job training
Door-to-Door Sales Workers, News and Street Vendors, and Related Workers	Sales and Related Occupations	153.8	142.3	-11.5	-7.5	High school diploma or equivalent	None	Short-term on-the-job training
Food Service Managers	Management Occupations	320.6	310.0	-10.6	-3.3	High school diploma or equivalent	1 to 5 years	None
Electrical and Electronic Equipment Assemblers	Production Occupations	182.9	172.4	-10.4	-5.7	High school diploma or equivalent	None	Short-term on-the-job training
File Clerks	Office and Administrative Support Occupations	185.0	176.2	-8.8	-4.8	High school diploma or equivalent	None	Short-term on-the-job training
Prepress Technicians and Workers	Production Occupations	50.8	42.8	-8.1	-15.9	Postsecondary non-degree award	None	None
Computer Operators	Office and Administrative Support Occupations	86.4	78.9	-7.4	-8.6	High school diploma or equivalent	None	Moderate-term on-the-job training
Postmasters and Mail Superintendents	Management Occupations	24.5	17.7	-6.8	-27.8	High school diploma or equivalent	1 to 5 years	Moderate-term on-the-job training
Office Machine Operators, Except Computer	Production Occupations	69.8	63.0	-6.8	-9.7	High school diploma or equivalent	None	Short-term on-the-job training
Pressers, Textile, Garment, and Related Materials	Office and Administrative Support Occupations	57.8	51.0	-6.8	-11.8	Less than high school	None	Short-term on-the-job training
Floral Designers	Arts, Design, Entertainment, Sports, and Media Occupations	66.5	60.3	-6.2	-9.3	High school diploma or equivalent	None	Short-term on-the-job training
Petroleum Pump System Operators, Refinery Operators, and Gaugers	Production Occupations	44.2	38.0	-6.2	-14.0	High school diploma or equivalent	None	Long-term on-the-job training
Loan Interviewers and Clerks	Office and Administrative Support Occupations	182.5	176.8	-5.7	-3.1	High school diploma or equivalent	None	Short-term on-the-job training
Paper Goods Machine Setters, Operators, and Tenders	Production Occupations	90.9	85.3	-5.5	-6.1	High school diploma or equivalent	None	Moderate-term on-the-job training
Chemical Plant and System Operators	Production Occupations	43.3	38.0	-5.3	-12.2	High school diploma or equivalent	None	Long-term on-the-job training
Photographic Process Workers and Processing Machine Operators	Production Occupations	58.7	54.2	-4.5	-7.7	High school diploma or equivalent	None	Short-term on-the-job training
Textile Knitting and Weaving Machine Setters, Operators, and Tenders	Production Occupations	22.5	18.4	-4.1	-18.2	High school diploma or equivalent	None	Moderate-term on-the-job training
Reporters and Correspondents	Arts, Design, Entertainment, Sports, and Media Occupations	51.9	48.0	-3.9	-7.5	Bachelor's degree	None	None
Semiconductor Processors	Production Occupations	21.1	17.3	-3.8	-17.9	Associate's degree	None	Moderate-term on-the-job training
Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	Production Occupations	29.0	25.4	-3.6	-12.4	High school diploma or equivalent	None	Moderate-term on-the-job training
Chemical Equipment Operators and Tenders	Production Occupations	47.4	43.8	-3.5	-7.5	High school diploma or equivalent	None	Moderate-term on-the-job training

¹ Represents the typical education level needed to enter the occupation.

² Indicates if work experience in a related occupation is commonly considered necessary by employers for entry, or is a commonly accepted substitute for formal types of training.

³ Indicates the typical on-the-job training needed to attain competency in the occupation.

NOTE: For more information about the education, work experience, and on-the-job training categories assigned to occupations, see www.bls.gov/emp/ep_education_training_system.htm.

Table 9. Employment and total job openings by education, work experience, and on-the-job training category, 2010 and projected 2020
(In thousands)

Education, work experience, and on-the-job training	Employment				Change, 2010-20		Total job openings due to growth and replacement needs, 2010-20 ¹	
	Number		Percent distribution		Number	Percent	Number	Percent distribution
	2010	2020	2010	2020				
Typical education needed for entry²								
Total, all occupations	143,068.2	163,537.1	100.0	100.0	20,468.9	14.3	54,787.4	100.0
Doctoral or professional degree.....	4,409.7	5,286.3	3.1	3.2	876.6	19.9	1,701.8	3.1
Master's degree	1,986.0	2,417.2	1.4	1.5	431.2	21.7	903.9	1.6
Bachelor's degree	22,171.1	25,827.2	15.5	15.8	3,656.1	16.5	8,562.4	15.6
Associate's degree	7,994.6	9,434.6	5.6	5.8	1,440.0	18.0	2,941.0	5.4
Postsecondary non-degree award	6,524.0	7,624.9	4.6	4.7	1,100.9	16.9	2,389.6	4.4
Some college, no degree.....	811.6	953.8	0.6	0.6	142.2	17.5	362.0	0.7
High school diploma or equivalent.....	62,089.6	69,665.7	43.4	42.6	7,576.1	12.2	21,745.9	39.7
Less than high school.....	37,081.7	42,327.4	25.9	25.9	5,245.7	14.1	16,180.8	29.5
Work experience in a related occupation³								
Total, all occupations	143,068.2	163,537.1	100.0	100.0	20,468.9	14.3	54,787.4	100.0
More than 5 years.....	4,612.4	4,956.0	3.2	3.0	343.6	7.4	1,368.5	2.5
1 to 5 years.....	17,103.0	19,078.2	12.0	11.7	1,975.2	11.5	5,638.7	10.3
Less than 1 year.....	3,129.6	3,535.2	2.2	2.2	405.6	13.0	1,125.2	2.1
None.....	118,223.3	135,967.7	82.6	83.1	17,744.5	15.0	46,654.9	85.2
Typical on-the-job training⁴								
Total, all occupations	143,068.2	163,537.1	100.0	100.0	20,468.9	14.3	54,787.4	100.0
Internship/residency.....	5,374.2	6,271.5	3.8	3.8	897.3	16.7	2,193.6	4.0
Apprenticeship.....	2,539.0	3,109.2	1.8	1.9	570.2	22.5	1,183.0	2.2
Long-term.....	7,039.0	7,920.5	4.9	4.8	881.5	12.5	2,545.5	4.6
Moderate-term.....	25,007.0	28,244.5	17.5	17.3	3,237.5	12.9	8,682.0	15.8
Short-term.....	58,171.0	66,040.0	40.7	40.4	7,869.0	13.5	23,767.8	43.4
None.....	44,937.9	51,951.3	31.4	31.8	7,013.4	15.6	16,415.5	30.0

¹Total job openings represent the sum of employment increases and replacement needs. If employment change is negative, then job openings due to growth are zero and total job openings equals replacements.

²Represents the typical education level needed to enter the occupation.

³Indicates if work experience in a related occupation is commonly considered necessary by employers for entry, or is a commonly accepted substitute for formal types of training.

⁴Indicates the typical on-the-job training needed to attain competency in the occupation.

NOTE: For more information about the education, work experience, and on-the-job training categories assigned to occupations, see www.bls.gov/emp/ep_education_training_system.htm.

Table 10. The 30 occupations with the largest projected number of total job openings due to growth and replacements, 2010-20
(In thousands)

Occupation	Occupational group	Employment		Change		Replacement needs	Total job openings due to growth and replacements ¹	Pre-employment		During employment
		2010	2020	Number	Percent			Typical education needed for entry ²	Work experience in a related occupation ³	
Retail Salespersons	Sales and Related Occupations	4,261.6	4,968.4	706.8	16.6	1,251.9	1,958.7	Less than high school	None	Short-term on-the-job training
Cashiers	Sales and Related Occupations	3,362.6	3,612.8	250.2	7.4	1,525.7	1,775.9	Less than high school	None	Short-term on-the-job training
Waiters and Waitresses	Food Preparation and Serving Related Occupations	2,260.3	2,456.2	195.9	8.7	1,128.4	1,324.3	Less than high school	None	Short-term on-the-job training
Registered Nurses	Healthcare Practitioners and Technical Occupations	2,737.4	3,449.3	711.9	26.0	495.5	1,207.4	Associate's degree	None	None
Combined Food Preparation and Serving Workers, Including Fast Food	Food Preparation and Serving Related Occupations	2,682.1	3,080.1	398.0	14.8	748.5	1,146.5	Less than high school	None	Short-term on-the-job training
Office Clerks, General	Office and Administrative Support Occupations	2,950.7	3,440.2	489.5	16.6	522.0	1,011.5	High school diploma or equivalent	None	Short-term on-the-job training
Laborers and Freight, Stock, and Material Movers, Hand	Transportation and Material Moving Occupations	2,068.2	2,387.3	319.1	15.4	661.1	980.2	Less than high school	None	Short-term on-the-job training
Customer Service Representatives	Office and Administrative Support Occupations	2,187.3	2,525.6	338.4	15.5	621.2	959.6	High school diploma or equivalent	None	Short-term on-the-job training
Home Health Aides	Healthcare Support Occupations	1,017.7	1,723.9	706.3	69.4	131.2	837.5	Less than high school	None	Short-term on-the-job training
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	Building and Grounds Cleaning and Maintenance Occupations	2,310.4	2,556.8	246.4	10.7	435.6	682.0	Less than high school	None	Short-term on-the-job training
Personal Care Aides	Personal Care and Service Occupations	861.0	1,468.0	607.0	70.5	68.2	675.2	Less than high school	None	Short-term on-the-job training
Childcare Workers	Personal Care and Service Occupations	1,282.3	1,544.3	262.0	20.4	403.8	665.8	High school diploma or equivalent	None	Short-term on-the-job training
Heavy and Tractor-Trailer Truck Drivers	Transportation and Material Moving Occupations	1,604.8	1,934.9	330.1	20.6	319.3	649.4	High school diploma or equivalent	1 to 5 years	Short-term on-the-job training
Postsecondary Teachers	Education, Training, and Library Occupations	1,756.0	2,061.7	305.7	17.4	280.4	586.1	Doctoral or professional degree	None	None
First-Line Supervisors of Office and Administrative Support Workers	Office and Administrative Support Occupations	1,424.4	1,627.8	203.4	14.3	381.0	584.4	High school diploma or equivalent	1 to 5 years	None
Elementary School Teachers, Except Special Education	Education, Training, and Library Occupations	1,476.5	1,725.3	248.8	16.8	324.4	573.2	Bachelor's degree	None	Internship/residency
Receptionists and Information Clerks	Office and Administrative Support Occupations	1,048.5	1,297.0	248.5	23.7	317.1	565.6	High school diploma or equivalent	None	Short-term on-the-job training
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	Sales and Related Occupations	1,430.0	1,653.4	223.4	15.6	336.5	559.9	High school diploma or equivalent	None	Moderate-term on-the-job training
First-Line Supervisors of Retail Sales Workers	Sales and Related Occupations	1,619.5	1,755.5	136.0	8.4	377.7	513.7	High school diploma or equivalent	1 to 5 years	None
Nursing Aides, Orderlies, and Attendants	Healthcare Support Occupations	1,505.3	1,807.2	302.0	20.1	194.1	496.1	Postsecondary non-degree award	None	None
Teacher Assistants	Education, Training, and Library Occupations	1,288.3	1,479.3	191.1	14.8	290.5	481.6	High school diploma or equivalent	None	Short-term on-the-job training
Bookkeeping, Accounting, and Auditing Clerks	Office and Administrative Support Occupations	1,898.3	2,157.4	259.0	13.6	208.8	467.8	High school diploma or equivalent	None	Moderate-term on-the-job training
Stock Clerks and Order Fillers	Office and Administrative Support Occupations	1,787.4	1,808.3	20.9	1.2	444.1	465.0	Less than high school	None	Short-term on-the-job training
Accountants and Auditors	Business and Financial Operations Occupations	1,216.9	1,407.6	190.7	15.7	261.4	452.1	Bachelor's degree	None	None
Landscaping and Groundskeeping Workers	Building and Grounds Cleaning and Maintenance Occupations	1,151.5	1,392.3	240.8	20.9	203.6	444.4	Less than high school	None	Short-term on-the-job training
General and Operations Managers	Management Occupations	1,767.1	1,848.6	81.6	4.6	328.5	410.1	Associate's degree	1 to 5 years	None
Carpenters	Construction and Extraction Occupations	1,001.7	1,197.6	196.0	19.6	212.3	408.3	High school diploma or equivalent	None	Apprenticeship
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	Office and Administrative Support Occupations	2,032.2	2,150.8	118.5	5.8	272.5	391.0	High school diploma or equivalent	None	Short-term on-the-job training
Maintenance and Repair Workers, General	Installation, Maintenance, and Repair Occupations	1,289.0	1,431.0	142.0	11.0	237.1	379.1	High school diploma or equivalent	None	Moderate-term on-the-job training
Food Preparation Workers	Food Preparation and Serving Related Occupations	813.7	897.9	84.1	10.3	293.0	377.1	Less than high school	None	Short-term on-the-job training

¹Total job openings represent the sum of employment increases and replacements. If employment change is negative, then job openings due to growth are zero and total job openings equal replacements. For more information about occupational replacement needs, see "Estimating Occupational Replacement Needs," on the Internet at www.bls.gov/emp/ep_replacements.htm.

²Represents the typical education level needed to enter the occupation.

³Indicates if work experience in a related occupation is commonly considered necessary by employers for entry, or is a commonly accepted substitute for formal types of training.

⁴Indicates the typical on-the-job training needed to attain competency in the occupation.

NOTE: For more information about the education, work experience, and on-the-job training categories assigned to occupations, see www.bls.gov/emp/ep_education_training_system.htm.

Construction Technology (CON) (AAS/CAS/CP)

About this Program

The Construction Technology program provides training in construction techniques, theory, and procedures. This program prepares student to enter the workforce with OSHA Construction 10-hour cards and NCCER Construction Technology certificates. This broad training prepares students for a variety of positions within the Construction Industry.

About this Degree • 64 credits

To complete an **Associate of Applied Science degree in Construction Technology** a student must complete 16 general education requirement credits, 37 program core requirements credits and 11 credits of required electives.

General Education Requirements • 16 credits

Communications • 6 credits

ENL 101 College Composition I.....3 credit
Plus one of the following:
SPT 120 Public Speaking.....3 credit
ENL 102 College Composition II.....3 credit
ENL 109 Technical Writing.....3 credit

Mathematics • 3 credits

MAT 101 Basic Technical Math.....3 credit
or MAT 103 or MAT 105 or MAT 109 or MAT 112 or any math class MAT 112 is a prerequisite

Discipline Studies • 7 credits

Per the AAS Discipline Studies list on page 64-65.
Arts and Humanities..... 3 credits
or
Social and Behavioral Sciences..... 3 credits
and
Physical and Biological Sciences..... 4 credits

Core Requirements • 37 credits

CON 100 Construction Math and Safety.....3 credit
CON 105 Engineering Principles and Construction Methods.....3 credit
CON 110 Plan Reading, Site Layout, Communication, and Employment..3 credit
CON 124 Masonry Systems.....3 credit
CON 125 Concrete Systems.....3 credit
CON 126 Framing Systems.....4 credit
CON 140 Construction Applications in Construction.....3 credit
CON 145 Roofing, Thermal, and Moisture Protection Systems.....3 credit
CON 200 Integrated Construction Management/Design Laboratory.....3 credit
CON 227 Electrical, Mechanical, and Plumbing Systems.....3 credit
CON 230 Sustainable Construction.....3 credit
CON 263 Estimating, Scheduling, and Planning.....3 credit

Required Electives • 11 credits

Select a minimum of eleven credits from the following courses:

CON (NCCER) Electives:

CON 241 Electrical Level 1.....3 credit
CON 242 Electrical Level 2.....3 credit

CON Electives:

CON 180 Construction Service Learning.....3 credit
CON 198 Construction Internship.....1 to 16 credit
CON 223 Heavy Highway Construction.....3 credit
Any CON course 100 level or higher

BUS Electives:

BUS 141 Principles of Econ (Micro)4 credit
BUS 117 Financial Accounting.....3 credit
BUS 115 Business Law.....3 credit
MAT 125 Statistics.....3 credit

Drafting Electives:

DRF 120 Technical Drafting.....3 credit
DRF 130 Architecture I.....3 credit
DRF 150 CAD I.....3 credit
DRF 230 Architecture II.....3 credit
DRF 250 CAD II Project.....3 credit

Welding Electives:

WLD 151 Cutting process & Weld Quality.....3 credit
WLD 152 SMAW Plate I.....3 credit
WLD 154 GMAW Plate3 credit

Heavy Equipment:

Any unduplicated 100 level HQO course or higher up to 11 credits

Speech, Theatre, and Film Electives:

SPT 220 Technical Theatre.....3 credit

And/or Select 6 Credits

Any unduplicated 100 Level Course or above.....6 credit

Certificate of Applied Science (CAS)

To complete a **Certificate of Applied Science in Construction Technology**, a student must complete:

MAT 101 (or MAT 103 or MAT 105 or MAT 109 or MAT 112 or any math class MAT 112 is a prerequisite), ENL 101, CON 100, CON 110, CON 124, CON 125, CON 126, CON 145, and CON 227 (28 credits)

Certificate of Proficiency (CP)

To complete a **Certificate of Proficiency in Construction Technology**, a student must complete: CON 100, CON 110, CON 124, CON 125, CON 126, CON 145, and CON 227 (22 credits)

Certificate of Proficiency (CP)

To complete a **Certificate of Proficiency in Drafting**, a student must complete: CON 100, CON 110, DRF 120, DRF 130, DRF 150, DRF 230, and DRF 250 (21 credits)

Approved