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**GETTING READY FOR HIGH-PAYING CAREERS IN MAINE | 2018**

# INTRODUCTION

It has been nearly a century since there was such opportunity in Maine for young and old alike to live here and have well-paying jobs. Today there are unfilled jobs at middle class pay scales all around the state, even in rural areas.

The reason these jobs are unfilled is that many potential job applicants don't have the minimum skills necessary. Many of the jobs do not require 4-year college degrees. But most do require some kind of credential that demonstrates competency—an associate's degree or professional certificate, or work experience

This *Educate Maine* report identifies the jobs and sectors that are in demand now, and that are projected to be in demand in Maine for the next ten years. For each of these sectors—computer analysis, construction, engineering, health care, hospitality, and manufacturing—the report describes the jobs that are in demand, the pathways for certification in each of these jobs, and how those interested can take the initial steps to get qualified.

We have been assisted in this report by industry and education experts who have provided guidance for the analysis in each of the sectors: Mike Bennett of Cianbro, Paul Bolin and Catharine MacLaren of Northern Light Health, Jean Ginn Marvin of Nonantum Resort, Steve Hewins of Hospitality Maine, Dana Humphrey of University of Maine's Engineering Department, Jason Judd of Project Login and Lisa Martin of the Manufacturers Association of Maine. We wish to thank each of them for their generosity with their time, and to also note that any errors or mistaken judgments in this report are not their responsibility.

For each job sector, we have provided data and charts on annual projected job openings, average pay, and education level by occupation. This data is derived from:

- Projected job openings and average wages: Maine Department of Labor, <https://www.maine.gov/labor/cwri/outlook.html>
- Knowledge and skills: O\*Net Online, U.S. Department of Labor, <https://www.onetonline.org>, [www.mynext-move.org](http://www.mynext-move.org)
- Education level by occupation, workers 25 years and older, 2015-16: Bureau of Labor Statistics, [www.bls.gov/emp/tables/educational-attainment.htm](http://www.bls.gov/emp/tables/educational-attainment.htm)

This short report is one of a series of policy briefs produced by *Educate Maine*. *Educate Maine* is a coalition of educators, business people, and government officials who believe that investment in education creates lifelong learners, opens pathways to promising careers, and grows the economy. It also produces civically engaged citizens who build vibrant communities.

For the past several years, *Educate Maine* has published *Education Indicators for Maine*, as well as this series of policy briefs.

The policy brief series is brought to you through a partnership between *Educate Maine* and the *Maine State Chamber of Commerce*, and through the generous support of the John T. Gorman and Nellie Mae Education Foundations. The production of the report was made possible by the contributions of Lisa Plimpton (research), Frank O'Hara (writing), and Pica // brand, strategy, design (design and layout).



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# COMPUTER ANALYSTS AND SUPPORT

## Typical Work Activities: Computer Analysts

- Coordinate software or hardware installation
- Monitor computer system performance to ensure proper operation
- Test software performance
- Modify software programs to improve performance
- Apply information technology to solve business or other applied problems
- Write computer programming code
- Collaborate with others to determine design specifications or details

## Demand

There are projected to be about 900 annual openings in Maine for Information Technology workers, at an average salary of about \$75,000.

Software engineers work for a handful of firms and do high-level technical work. Computer analysts, on the other hand work in a wide variety of organizations and settings: business, health care, government, education, and consulting. They review and analyze data, generate reports, create and manage websites, and perform other tasks that only require a modest level of computer science.

## Career Pathways

There are many routes to becoming a computer analyst, including informal training, an internship, a two-year degree, a certificate, and/or a four-year degree.

Traditionally, analysts have had a four-year degree at one of the public or four-year universities in computer science or info tech. Now many enter the profession with associate's degrees and certificates. Some analysts are self-taught.

Today internships in computer science are widely available for Maine students through Project Login

(<http://www.projectlogin.com/internships>). A student can get paid, get experience in the field, and get a head start on a permanent job through a summer or school year internship.

Another option is to start working and then build in continuing education and training. Many companies have preferred career training paths, and will financially support the employee's progress along those paths.

Universities as well are doing a better job connecting short-term training with long-term degrees. Once students finish a certificate program, they can pursue a job, or can connect to a higher degree program.

The unmet demand for all computer-related jobs has made both employers and schools open to flexible arrangements to meet the needs of applicants.

**How to get started:** Try to find out what industry you would like to work in, and what you like to do—whether you like data analysis or programming, or both. If you're not sure, choose a shorter-term path, like a one-year certificate program. Students should explore and sample the field before they commit to a four-year program.

The University of Maine at Augusta (UMA) has federal TechHire funding available to provide accelerated computer training for 500 students, free of charge (others can participate at cost). The program takes one year, and consists of 5 courses and an internship. Successful students receive a certificate of achievement. Contact the University of Maine ([www.uma.edu](http://www.uma.edu)) or Coastal Counties Workforce, Inc. (<http://www.coastalcounties.org>) for details.

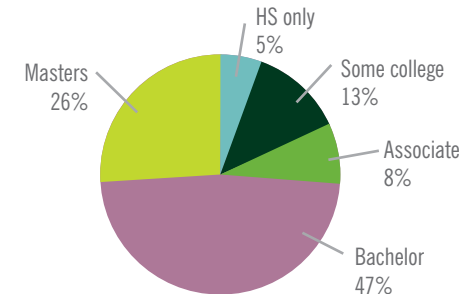
## ANNUAL MAINE JOB OPENINGS



## AVERAGE MAINE SALARY



## EDUCATION LEVEL OF ANALYSTS



# CONSTRUCTION

## Typical Work Activities: Carpenters

- Review blueprints or specifications to determine work requirements
- Measure materials or objects for installation or assembly
- Cut wood components for installation
- Install wooden structural components, building fixtures, doors & windows
- Verify alignment of structures or equipment

## Demand

There are projected to be about 5,000 annual openings in Maine for construction industry workers, at an average salary of about \$46,000.

The industry has an acute shortage of skilled workers in all professions: carpenters, electricians, laborers, plumbers, welders, iron workers, pipe fitters, millwrights, masons, and truck drivers.

The earning potential is significant, and the worker shortage is driving wages up.

The big unknown is how new technologies will disrupt the industry. Remote-controlled equipment, artificial intelligence, robotic exoskeletons, are all coming. Today all construction workers need some understanding of higher math and computers, and those who have mastered both information technology and construction have great opportunities.

Only 9% of construction workers are women, and for those women who are interested in construction, the demand is very high.

**How to get started:** Young people interested in construction should check out the Career and Technical Education (CTE) program in their local high school. Older people can contact their local CareerCenter (see <http://www.mainecareercenter.gov/>) to find training options. Also, some companies will hire and train people who have no prior construction experience. Cianbro, for instance, offers Boot Camp for people who have no construction experience (see <https://www.cianbro.com/CianbroInstitute.aspx>).

## Career Pathways

The most common education and training pathway to construction is through a CTE program. The traditional model is for students to enter a construction pathway during high school. After graduating from high school, such students either enter the workforce, continue at a community college, go on to a four-year degree, or enter the military.

There are earn-while-you-learn models that many companies are implementing—such as apprenticeships and learning alongside a mentor while working.

Companies will invest in individuals who don't have all the necessary skills, but who are willing to work. Cianbro Corporation, for example, identifies people with aptitude (ability to learn) and attitude (willingness to learn), and regardless of age, will teach them the skills they need to succeed. Cianbro has retrained hundreds of employees all over the country, both on-site and off-site. Off-site training is provided through television, phone apps, and mobile trailers.

Mike Bennet of Cianbro says, "We want lifelong learning, we want people to continue to be educated throughout their careers. You're working more with your head than with your hands or your back in construction now."

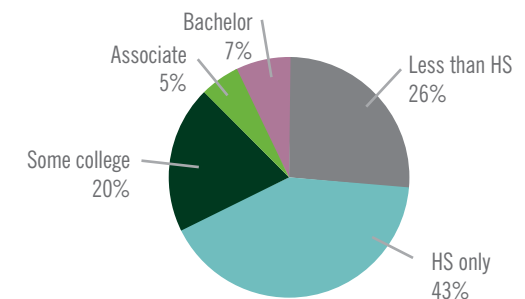
## ANNUAL MAINE JOB OPENINGS



## AVERAGE MAINE SALARY



## EDUCATION LEVEL OF CONSTRUCTION WORKERS



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# ENGINEERING

## Typical Work Activities: Mechanical Engineers

- Review technical documents to plan work
- Design industrial processing systems and industrial equipment
- Evaluate characteristics of equipment or systems
- Confer with other personnel to resolve design or operational problems

## Demand

There are projected to be about 500 annual openings in Maine in the field of Science, Technology Engineering, and Mathematics, at an average salary of about \$84,000.

University of Maine sees employer demand for all types of engineering graduates. In a recent year in Maine, there were 410 jobs advertised for mechanical engineers, 260 for civil engineers, 215 for electrical and computer engineers, and 205 for construction engineers/managers (data from Burning Glass Technologies).

In order to replace retiring engineers and account for economic growth, University of Maine Dean of Engineering Dana Humphrey estimates that the state will need to roughly double the number of engineering graduates it is producing.

## Career Pathways

A student must get a four-year degree to become an engineer. The traditional pathway is to enroll in a bachelor's program at the University of Maine (Orono), the University of Southern Maine, or the Maine Maritime Academy. No private colleges in Maine offer engineering degrees.

But new routes to an engineering career are opening up. In the fall of 2018, the Maine Engineering Pathways program was launched. Students can now start at University of Maine campuses in Presque Isle, Machias,

**How to get started:** For high school students, getting an early exposure is crucial. The University offers the *UMaine Engineering Tour* in Orono on most Fridays. The University also offers the *Consider Engineering* program in the summer between junior and senior years of high school, a four-day intensive exposure on the Orono campus.

To be ready to study engineering in college, it is helpful for high school students to take math up through precalculus and at least two lab sciences (biology, chemistry and/or physics). If the high school or local CTE center has pre-engineering courses or a full-fledged program, it is helpful for interested students to participate. Finally, many high schools have engineering extracurricular activities, such as robotics, and these are fun ways for students to get a taste of the possibilities of engineering.

Augusta, and Farmington for the first year of courses, then transfer to the University of Maine (UMaine) for the remaining three years.

It is also possible to start at a community college then transfer. The Southern Maine Community College (SMCC) and the University of Southern Maine (USM) have developed a "2+2" agreement to allow associate degree graduates of SMCC's engineering program to enter USM's programs for mechanical and electrical engineering with two full years of credit toward a bachelor's degree

Even high schools are getting into the act. Bangor High School and Thornton Academy have pre-engineering programs. Two students from Thornton Academy started at UMaine last year with a full year of engineering credit already earned. More high schools are exploring this option and will offer such a program in the future. Also courses at Community Technical Education (CTE) centers can help. The Northern Maine CTE center is working with UMaine to have its CAD (computer assisted design) courses count for engineering credit.

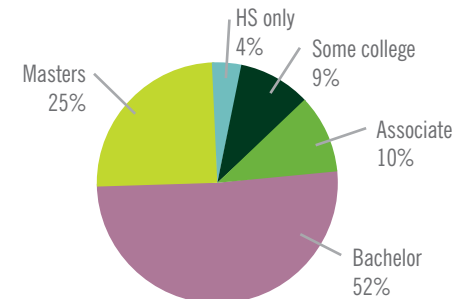
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## AVERAGE MAINE SALARY



## EDUCATION LEVEL OF ENGINEERS



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# HEALTH CARE

## Typical Work Activities: Registered Nurses

- Maintain medical facility records
- Monitor patient conditions during treatments, procedures, or activities
- Administer medications
- Inform medical professionals regarding patient conditions and care
- Record patient medical histories

## Demand

There are projected to be about 5,800 annual openings in Maine in the health care sector, with an average salary of about \$65,000.

Northern Light Health (formerly Eastern Maine Health Systems) reports that it could hire 200+ nurses today. These are good-paying jobs, particularly for parts of the state where good-paying jobs are scarce.

The largest number of available jobs is for registered nurses (RNs) and medical assistants. There is also acute demand for physical and respiratory therapists.

Health care is moving toward home care and community health. This is opening up more options. If you are a nurse, besides working in a hospital, you can also be mobile and travel to patients, or be completely office-based doing administration.

## Career Pathways

The quickest way to become a nurse is to get an associate's degree. But some nurses have bachelor's, and some have master's degrees. There are 16 nursing programs in Maine—at the community colleges and university campuses, Husson University, and the Maine College of Health Professions. For medical assistants, there are several certification programs in the state.

**How to get started:** Health care is a field with lots of opportunity for employment and advancement. Interested high school students should try to get some hands-on experience. Volunteering, job shadowing, interning, helps students get a better sense of whether health care is something they like, something they want to pursue. High schools students should have a good background in science and math as preparation for further health care studies. For those not interested in going to college, certificate programs for CNAs and medical assistants are available.

There are programs available that are specifically focused on adults. Maine's Career Centers and local adult education programs can provide guidance. Many skills from other industries are transferable to health care, and many jobs in health care don't involve dealing with patients. Health organizations hire administrators, accountants, attorneys, plumbers, electricians, human resources people, etc. For veterans looking for a new career, there are crosswalks that have been developed to see how military career skills apply in the health field.

It is possible to work one's way up over time. One nurse at Eastern Maine Health Care advanced from housekeeper to lab tech to certified nursing assistant (CNA) to emergency room nurse to nursing manager.

Health care employers often offer existing employees help in furthering their careers—including training and education, tuition reimbursement, and sometimes loan forgiveness.

Health care employers also have partnerships with existing education and training programs—including adult education, community colleges, and the University—for on-the-job training and continuing education.

It's a great field in which to work your way up—there are many pathways to advance.

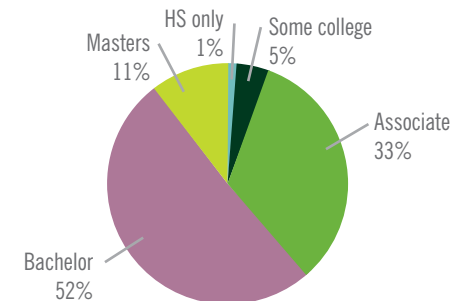
## ANNUAL MAINE JOB OPENINGS



## AVERAGE MAINE SALARY



## EDUCATION LEVEL OF NURSES



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# HOSPITALITY

## Typical Work Activities: Cooks

- Clean food preparation areas, facilities, or equipment
- Inspect facilities, equipment or supplies to ensure conformance to standards
- Cook foods
- Check quality of foods or supplies
- Assess equipment functioning

## Demand

There are projected to be about 14,000 annual openings in Maine in the hospitality sector, with an average salary of about \$27,000.

In 2018, the magazine *Bon Appetit* declared Portland, Maine the “Restaurant City of the Year.” The Lost Kitchen in Freedom, Maine, was featured in the *New York Times*, *Washington Post*, and Martha Stewart’s blog. Maine is now a destination for fresh local food and imaginative chefs.

Maine as a food destination may be new, but not Maine as a destination. Steve Hewins of Hospitality Maine notes that “*Hospitality has been a leading industry in the state for 150 years.*”

Hospitality rewards creativity, energy, and hard work. From the entry level jobs that are good for immigrants and young people, people can work their way up to managers of restaurants and hotels. Jean Ginn Marvin of Nonantum Resort says, “*This industry gives you the opportunity to reinvent yourself. There’s front of the house, management, administration, marketing.*” The potential for growth in this sector is only limited by one’s imagination.

**How to get started:** Getting an entry-level job is the most common pathway. But a great entry point is the community college system, for both young and old. It is low cost, easy, and almost guarantees a job. Many students get poached by employers before they even finish their programs.

## Career Pathways

The most common way into hospitality is through an entry-level job. From there some people eventually progress into management.

There is an academic hospitality employment track, starting in high school, going through community college, and ending at the university level. The University of Southern Maine (USM) has a four-year degree, and several Maine Community Colleges have two-year degree programs in culinary arts and hospitality management that can stand alone or feed into the four-year program. Husson and St. Joseph’s also have programs.

Eight of the Community Technical Education (CTE) centers run a high school culinary program called Pro Start. ProStart students usually go on to culinary school for a two-year or four-year degree and become chefs. Jean Ginn Marvin observes that “*There’s a huge opportunity in culinary right now, especially in Maine. Everyone wants to be in the kitchen, that’s where it’s happening.*”

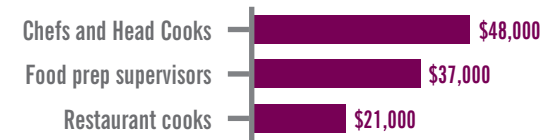
The nonprofit Hospitality Maine became an apprenticeship sponsor in 2018. Their program allows people to make money while they earn college credentials. There are two tracks: culinary studies and hospitality management. The program requires 2,000 classroom hours and 2,000 working hours over two years, with work-friendly scheduling.

The skills learned in the hospitality industry transfer to many other sectors. Employees learn how to sell, to serve people, to prioritize, and to stay cool under pressure. It is a field that requires a high EQ (emotional quotient) as well as a high IQ (intelligence quotient).

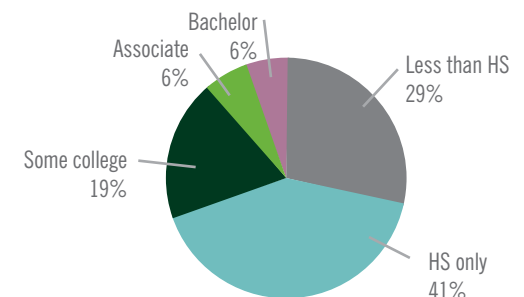
## ANNUAL MAINE JOB OPENINGS



## AVERAGE MAINE SALARY



## EDUCATION LEVEL OF COOKS



# MANUFACTURING

## Typical Work Activities: Welders

- Operate welding equipment
- Assemble metal or plastic parts or products
- Align parts or workpieces to ensure proper assembly
- Measure dimensions of completed products to verify conformance to specifications

## Demand

There are projected to be about 5,000 annual openings in Maine in the manufacturing sector, with an average salary of about \$43,000.

There are many myths about manufacturing in Maine. Some think it is a disappearing sector. Some think the work is dirty and unskilled.

In fact manufacturing is thriving in Maine. But it's not your grandfather's mill. Manufacturing is transforming itself into a high-technology, flexible, adaptive, rapid response sector.

The greatest demand is for woodworkers, boatbuilders, machinists, and welders.

## Career Pathways

The ideal pathway is for students to take courses at their local high school and CTE program, then go on to a certificate program at a private or public training provider or at a Maine Community College or University of Maine System campus.

Many adults have work experience and job skills that are transferable to manufacturing. They can get hired right away, then get additional training or education on the job to advance in the industry. Recently a violin maker was hired by a high-tech company in Augusta.

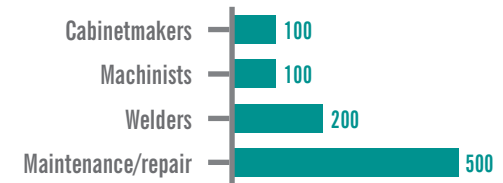
Manufacturers are making significant investments in training—it's probably doubled in past few years.

The Maine State Chamber of Commerce believes that it is important to encourage students at a young age to pursue careers in manufacturing. Dream It Do It is the Chamber's marketing effort to inform students, parents and educators and provides access to online resources to learn about career opportunities at Maine manufacturers.

The Manufacturers Association of Maine has special programs to help their member corporations to hire non-traditional employees. The Association helps military veterans translate their skills and experience into terms employers can understand; and helps New Mainers (recent immigrants) achieve and demonstrate their English language skills. Every few weeks they send their member companies a batch of resumes of nontraditional applicants for consideration in hiring.

**How to get started:** Students and adults with an interest should tour or job shadow at a local manufacturing company to see modern manufacturing in action, to explore one's interest, and to see what aspect or field of manufacturing might be appealing. The Maine Dream It Do It (DIDI) initiative, overseen by the Maine State Chamber of Commerce's Manufacturing Council, markets workforce opportunities in manufacturing to Maine students, parents and educators. The Maine Association of Manufacturers (MAM) offers tours of manufacturers all around the state throughout the month of October. MAM also showcases 5 or 6 companies at the Maine Science Festival in Bangor during March.

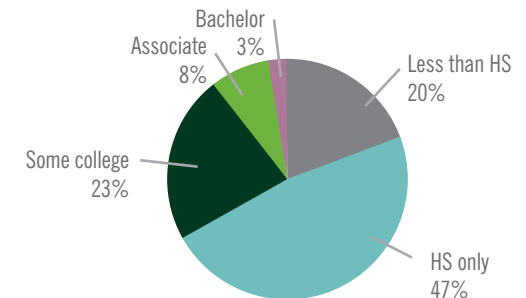
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# POLICY CHALLENGES

## Embracing a new paradigm

Here's the old paradigm of a high school education:

- 1) The success of a high school is judged by how many graduates go on to prestigious colleges.
- 2) Guidance counselors have scant time to help students understand and prepare for post-graduation career pathways.
- 3) High-achieving students are not encouraged to try vocational and technical courses.
- 4) Computer science, engineering, and information technology courses are considered luxuries and not offered.
- 5) Business has little involvement with students until after they graduate.

Maine schools are rapidly changing away from these old practices. Still, too many young Maine graduates go on to college programs that they are not interested in or suited for, and they end up dropping out and carrying large college debt burdens—and after wasting time and money, they may be frustrated that they still can't qualify for the good-paying jobs available in the Maine economy because they lack the credential.

Here's a new paradigm of a high school education:

- 1) The success of a high school is judged by how many graduates are on an effective pathway to satisfying and productive work.
- 2) High school students are exposed to different workplaces and education/training options.
- 3) Career and Technical Education (CTE) courses in computer programming, nursing, pre-engineering, construction, and other subjects are a part of every student's education.

- 4) Guidance counselors understand and communicate the variety of pathways available for good-paying jobs in Maine.
- 5) Business, government and nonprofit leaders are actively involved in their local schools—providing mentoring, internships, summer jobs, open houses; and contributing equipment and money for technical courses.

Embracing the new paradigm is like turning a battleship around. The change is underway, but much more is needed from the Maine Department of Education, school boards, local employers, and foundations.

## **SPECIFICALLY, FOR THE SECTORS DISCUSSED IN THIS REPORT, HERE IS WHAT OUR EXPERT INFORMANTS SAY IS NEEDED:**

### **Computer Science**

Every K-12 system in Maine should have a computer science sequence. This requires investment in technology and teacher training on a large scale. Computer science is a useful skill in virtually every economic sector in Maine. Without early exposure to computer science, young girls in particular do not develop an interest or aptitude.

The Maine Department of Education should have a computer science representative, and provide targeted funding for local school programs. Some employers are involved now through *Educate Maine*, but many more need to join in.

### **Construction**

CTE centers need expanded funding and better scheduling coordination with high schools. The wide variety of programs CTE centers currently offer needs to be reviewed to ensure that all meet the same high standards of excellence.

### **Engineering**

Every high school in Maine should have a pre-engineering program. And starting in kindergarten, kids need to be introduced to all the letters in STEM—not just science and math, but technology and engineering as well.

### **Nursing**

Maine has a big shortage in nursing faculty—most are close to retirement age. That reduces the state's ability to train new nurses for the future. We need to increase the pay of nursing instructors. They might make half of what an experienced nurse would make in direct care. This fact has been well known for years—now the funding must be found.

### **Hospitality**

The biggest challenge in this sector is to find funding for the hospitality apprenticeship program. The program needs to be free for trainees in order to have the desired impact.

### **Manufacturing**

State government needs to support industry-led workforce development. The experience of the Manufacturers Association of Maine is that public training programs are most effective when industry identifies the training that is needed in advance. Current public job training programs are not as effective as they could be.