

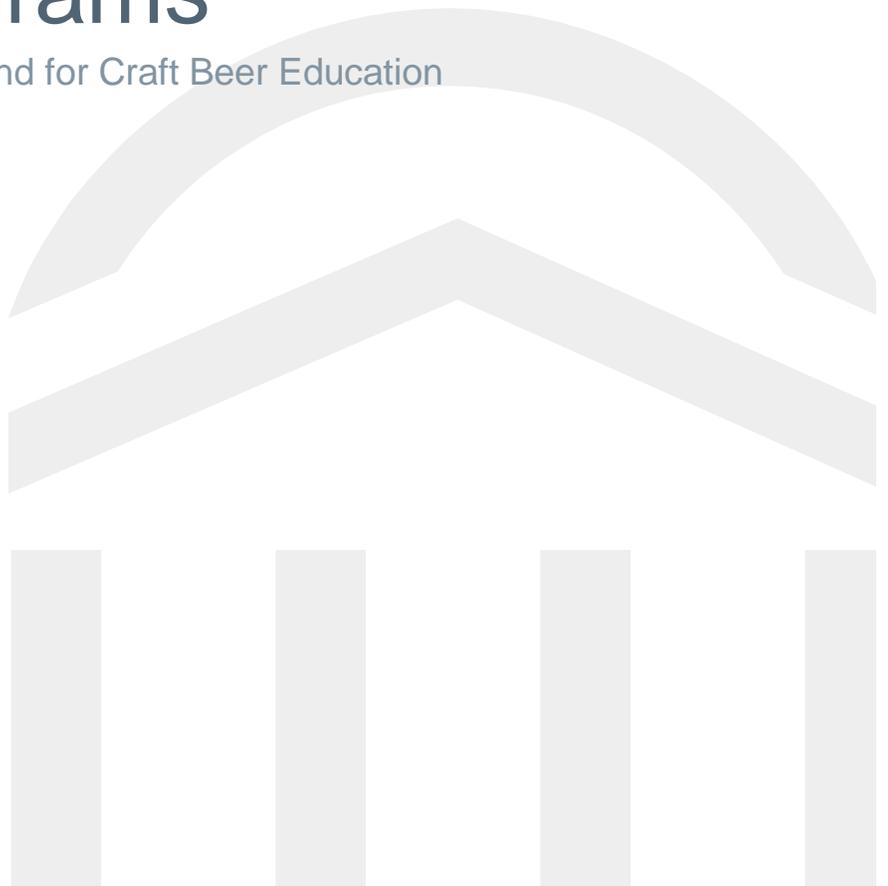


Education
Advisory
Board

COE Forum

Market Demand for **Craft Beer** Programs

Evaluating Market Demand for Craft Beer Education



Research Brief

eab.com

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Table of Contents

1) Executive Overview	4
Key Observations	4
2) Craft Beer Program Content and Credentials	5
Curricula.....	5
Alignment with Employment Needs	7
3) Program Development.....	9
Faculty Requirements.....	9
Facility Requirements	9
Program Development Process.....	10
4) Student and Employer Recruitment.....	12
Student Profile.....	12
Student Marketing	13
Employer Marketing	14
5) Student Outcomes	18
Employment Opportunities	18
6) Research Methodology.....	20
Project Challenge.....	20
Project Sources.....	20
Research Parameters.....	20
Burning Glass Labor/Insight™	21
Appendix A: Brewing Sciences Programs	22

1) Executive Overview

Key Observations

Develop specialized programs built on existing institutional strengths to channel institutional reputation for recruitment and decrease development costs. Programs that expand on existing curricular offerings benefit from the reputation of established academic programs. For example, well-established hospitality management programs support beverage management specializations; fermentation sciences specializations benefit from existing biotechnology or food science programs. New programs incorporate existing courses into the curriculum to reduce program development costs and borrow faculty already employed at the institution.

Offer continuing education courses and certificates initially to test local demand. Institutions interested in starting a brewing or beer service program can gauge the demand for a degree program from the popularity of certificate or non-credit offerings. Certificate programs focus narrowly on beer production and brewery business operations. If certificates prove popular, degree programs expand to encompass other alcoholic beverage production processes and industries. This expansion provides career flexibility for program graduates and serves long-term state economic demands regardless of individual industry fluctuations.

Partner with local employers to develop industry-relevant curricula and identify employment opportunities for program graduates. Program directors invite industry professionals to serve as guest lecturers and adjunct faculty. Program staff also join trade organizations and attend industry conferences to identify emerging skills and gauge employer demand for program graduates.

Contacts at established programs perceive competition from new programs in the beer education space and exhibit reluctance to share competitive information. Directors of profiled programs did not disclose initial investments, program revenues, or budgetary information. The student demand for beer education remains high as established fermentation science programs maintain multi-year waiting lists and newer programs meet enrollment caps very quickly (i.e., within 20 minutes after registration opens). However, as new programs proliferate (the Master Brewers Association of the Americas reports 20 brewing science programs currently in development), directors of established programs and members of industry organizations fear a glut of certification-bearing graduates will saturate the craft beer job market in several years. Expansion of successful beer production or business operations certificate programs into broader degree programs that include alternative beverages offers a potential strategy to prepare students for an impending competitive job market.

Partnerships with industry training groups offer nominal collaboration but few benefits. Institutions that collaborate with organizations such as the Siebel Institute provide campus space for partner organizations but do not share students, curricula, or courses. Institutional students may observe brewing processes performed by industry group instructors but do not participate in trainings or courses. Industry training organizations possess separate and distinct missions from institutions of higher education, and contacts cite lack of shared goals as a barrier to collaboration.

2) Craft Beer Program Content and Credentials

Curricula

Align Craft Beer Offerings with Preexisting Curricular Strengths

Two categories encompass profiled programs: hospitality/beverage management and fermentation science. Both program types teach the science and the business of craft beer. Beverage management programs introduce students to the basic principles of brewing, but focus courses on business content. Fermentation science programs, however, devote one or two core courses to business development and marketing and dedicate the remaining courses to science and production coursework (e.g., brewing science and analysis).

Institutions determine program focus based on existing programs and faculty strengths.

Institution E offered a popular business of wine certificate before developing an analogous non-credit program in the business of craft beer. Many fermentation sciences programs offer long-standing viticulture curricula and expand into brewing sciences due to the growth of the craft beer industry.

Programs incorporate existing courses into the curriculum to reduce program development costs. **Institution A's** brewing, distillation, and fermentation A.A.S. degree borrows several existing courses within hospitality management and economics for the program's business components.

Curricular Overlap

Specialization in institutional strengths increases the number of potential courses overlapping with existing curricula.

Sample Degree Program Curricula



B.S. Hospitality Management, Beverage Management Concentration

Institution D

- Introduction to Beers, Wines, and Spirits
- The Business of Beverage Management
- Beer and Fermentation
- Intermediate Wines
- Spirits and Mixologies
- Advanced Wine Knowledge
- Industry Stages



B.S. Fermentation Sciences

Institution B

- Principles of Fermentation Sciences
- Sensory Analysis of Wine and Beer
- Wine Production and Analysis
- Brewing Science and Analysis
- Fundamentals of Organic Chemistry
- Microbiology
- Soil & Soil Fertility Management
- Survey of the Hospitality & Tourism Industry

Continuing and Online Education Units Offer For-Credit and Non-Credit Certificates

Unit ability to award academic credit determines if programs award for-credit or non-credit certificates.

Institutions develop certificate programs in continuing, distance, or professional education departments to bring programs to market more quickly. Certificate programs focus narrowly on beer production or brewery business operations to propel students into the craft beer industry. Degree programs encompass more expansive topics and other alcoholic beverages to provide career flexibility for graduates. Beverage management degrees incorporate wine and spirits industry content, for example. Fermentation science degrees expand to wine production, distillation, and biotechnology.

Program Modality

Programs can deliver courses that cover business topics such as management and marketing online. Students must learn other beer education topics, including brewing sciences and beverage service, through hands-on applications.

Certificate Programs

Craft Beer Certificate (face-to-face), Institution C

Course Name (Department) and Subject Matter
Principles and Biochemistry of Brewing (Biology) Raw materials, enzymes, proteins, wort production, hop analysis, sensory evaluation (4 credits)
Merchandising Management for Microbrewing (Retail Management and Technology) Selling process, operations management, distribution process, behavioral concepts, business plan creation (5 credits)
Brew Process Technology (Industrial Engineering Technology) Understanding the brew house, efficiency, heating and cooling, wort transfer, cleaning, and packaging techniques (3 credits)
Brewing Microbiology (Biology) Microbiological techniques, yeast biology, wild yeasts, yeast production, microorganisms in the brewery, sanitation (4 credits)

Brewing Business Certificate (online, non-credit), Institution E

Course Name and Subject Matter
Basic Business for Craft Beverages Brewing industry overview, including agriculture, bottling, and distribution; industry trends, competitive dynamics, regulatory environment, market opportunities, business plan creation
Craft Beverage Business Management Distribution, product management, quality control, and ROI for capital investments (brewery capacity, fixed and variable costs of operation, forecast and production planning, material procurement and storage, packaging management, operations and distribution plan creation)
Strategic Craft Beverage Marketing Key market drivers, segments
Finance and Accounting for Craft Brewing Microbiological techniques, yeast biology, wild yeasts, yeast production, microorganisms in the brewery, sanitation



Proliferation of Academic Brewing Programs Concerns Established Programs and Trade Associations

The Master Brewers Association of the Americas (MBAA) and established fermentation sciences programs such as those at **Institution G** and **Institution B** express concern over the rapid development of new brewing and craft beer programs. Concerned parties foresee a craft brewery industry labor market saturated with certificate-holding candidates five to six years in the future.

The MBAA identifies 34 brewing programs in North America (20 currently in operation, 14 in development). The MBAA has convened a higher education committee to examine operating and prospective programs (see Appendix A) and potentially establish oversight for instructor credential qualifications and required content.

Enrichment Courses Target Industry Professionals and Campus and Community Members

Continuing education offerings do not require resources beyond those in the certificate or degree program and appeal to a wide audience. **Institution A** offers a craft beer business certificate covering “beerology,” “beeronomics,” beer ingredients, and beer tasting. Beerology and beeronomics courses, as program directors describe them, introduce students to beer as a defined subject and present the beer manufacturing and supply chain. **Institution C** offers non-credit courses in beer tasting that program directors market internally to the campus community. Forty to fifty attendees enroll, composed mostly of university faculty, but the continuing and online education division plans to open the course to the wider community.

Alignment with Employment Needs

Confer Technical Skill and Understanding for Students to Pass Certification Exams (e.g., Cicerone certification)

Several craft beer programs prepare students to sit for certifications in beer connoisseurship or brewing. Certifications attract employers to graduates. The hospitality management program at **Institution F** offers a seminar in Quality Brewing and Fine Beer that prepares students for the Cicerone certification in beer serving and connoisseurship. The course confers skills in proper beer presentation, handling, and quality control as well as food pairings, marketing, and brewing processes. The regional craft beer industry increasingly values the Cicerone certification program; breweries that hired graduates from Institution F with Cicerone certificates also send other employees to obtain the certification.

Institution B offers a brewing short course for craft brewery workers and home brewers who seek understanding of scientific concepts to prepare for the Institute for Brewing and Distilling (IBD) exam. The course assumes students possess prior brewing experience, and focuses on providing technical support and lab analysis, scientific principles and theories of fermentation, and quality assurance and control.

Focus Program Content to Serve Employer Demand for Sales and Production Planning

Facing crowded competition and low advertised demand for brewing, prospective programs should focus on aspects of the craft beer industry other than brewing. Online job postings indicate high demand for sales and marketing positions as well as supply chain management and business planning positions. Less than four percent of postings request candidates for brewing positions.

Marketing positions require highly demanded skills such as:

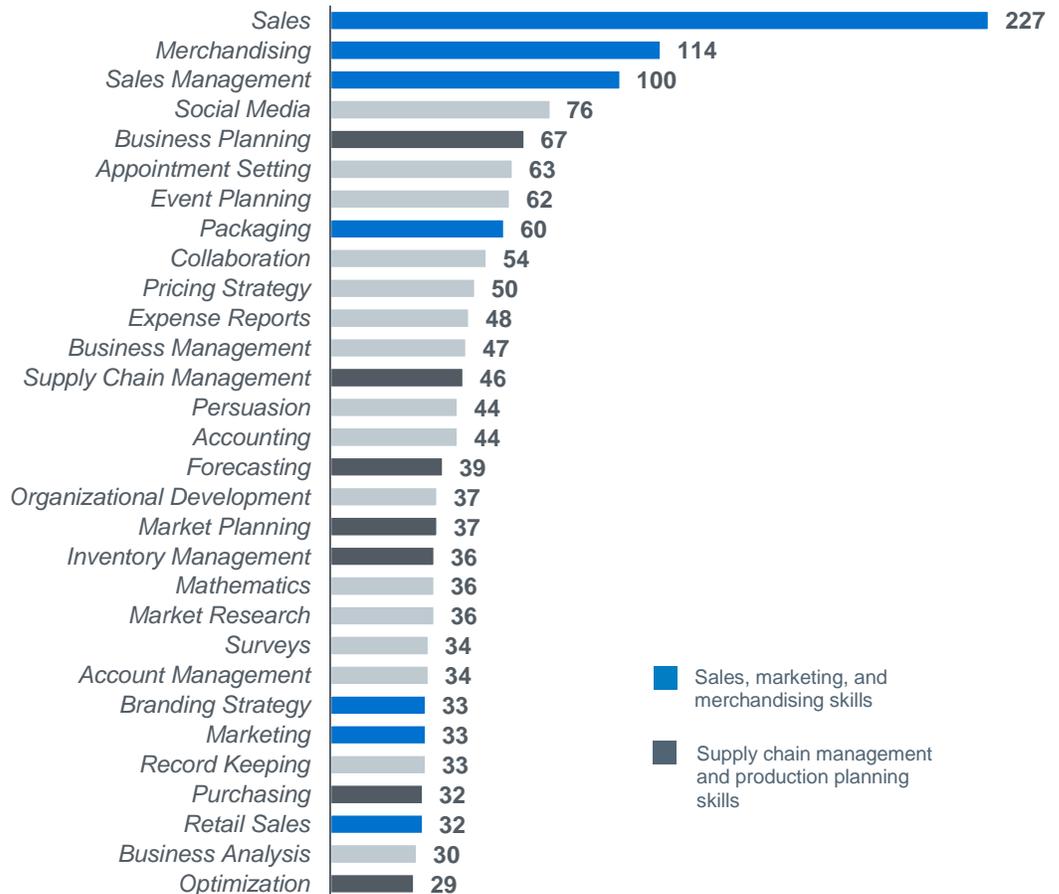
- Sales,
- Merchandising, and
- Branding strategy.

Production planning positions require:

- Supply chain management,
- Market planning, and
- Inventory management abilities.

Top Skills Requested by Craft Breweries

National Data, August 2013 to July 2014



n = 773 with 52 unspecified
Source: Burning Glass Labor/Insight™

3) Program Development

Faculty Requirements

Credit-Bearing Programs Require Faculty with Industry Experience and Academic Credentials

Program directors report that faculty recruitment poses the single largest barrier to program development. The craft beer industry does not boast great numbers of professionals with significant industry experience, advanced degrees, and teaching ability.

Degree programs require faculty with terminal degrees to meet accreditation standards. Certificate programs require a director with advanced academic credentials but may employ more industry professionals as adjunct faculty to staff courses.

Even directors of non-credit certificate programs, which can employ more adjunct faculty and guest lecturers, report difficulty identifying industry experts capable of lesson plan design, student performance assessment, and course material delivery. Programs in urban areas with high densities of craft breweries, like **Institution D** in Chicago, may encounter fewer challenges with qualified faculty recruitment.

Faculty Requirements based on Credential Type

Certificate Program Faculty



Program Director

Degree Program Faculty



Fermentation Sciences Director

Instructors without terminal degrees only serve as adjunct faculty.



1 to 3 Adjunct Faculty from Industry



Fermentation Sciences Faculty

Biotechnology and Molecular Chemistry Sciences Faculty

Faculty Requirements

Incrementally Scale Equipment and Facilities to Match Enrollment Targets

Contacts at **Institution A** warn against scaling programs up too quickly and encourage directors to align equipment procurement with enrollment caps.

Certificate programs first purchase laboratory and homebrewing equipment. The craft beer certificate program at **Institution C** teaches students brewing principles on modified homebrew and laboratory equipment. Programs at both Institution C and **Institution F** plan to acquire professional systems and facilities as programs expand.

Fermentation science programs offer laboratory equipment and industry equipment and instruments for students to learn biochemical processes at different scales. Students first

create samples at the laboratory-scale before learning to produce recipes at pilot-scale on commercial systems.

Facility and Equipment Requirements

Institution

Accesses facilities with 4 brew systems, each designed for a team of six. Equipment includes 6 microlab stations (what students would use at a small brewery); a 7-10 barrel system (which holds 14-20 kegs), an automatic canning machine, a full distillation tower system, and a microwinery.

Institution A shares the building with the state biotechnology center and uses some of the center's larger equipment instead of purchasing additional resources.



Beverage and Hospitality Management Program Requirements

- *Glassware for tasting*
- *Homebrew kettle for basic principles of brewing instruction*



Brewing Certificate Requirements

- *Laboratory equipment for basic fermentation instruction*
- *Homebrew kettle for brewing instruction*



Fermentation Sciences Requirements

- *Laboratory equipment for biochemistry instruction and research*
- *Access to commercial equipment (e.g., fermenters, beer kettles) for industrial-scale brewing instruction*



Partner with Local Brewpub with Spare Production Capacity to Reduce Development Costs

Institution C suggests partnering with a local brewery during off-production hours for hands-on experience without capital outlays. New programs should consider forming a timeshare with a brewpub facility if the brewpub does not use the facility and equipment at full capacity.

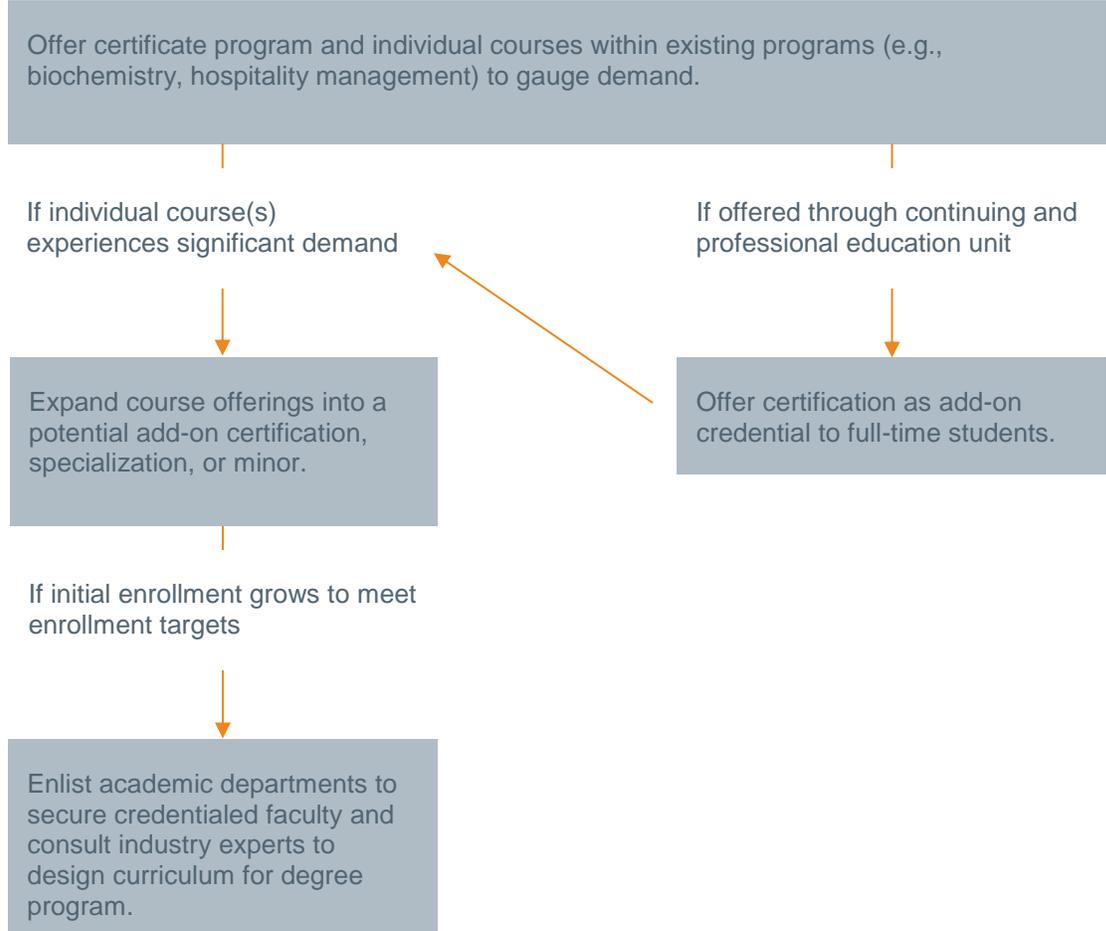
Program Development Process

Develop Craft Beer Courses and Certificate Programs to Gauge Student Demand before Expanding to Full Degree Offerings

For institutions interested in starting a craft beer education program, the popularity of certificate and non-credit offerings helps program directors gauge regional demand for a full program. Program directors at **Institution C** have offered a part-time craft beer certificate for five years, during which initial enrollment doubled to 20 students and met the threshold for full degree development. Faculty are developing a Bachelor of Science in Interdisciplinary Studies in Brewing through the biology department; certificate courses will serve as the foundation of program content. Program directors anticipate inaugural enrollments of two to five students.

Program Development Stages

In addition to certificates and degrees, offer enrichment (e.g., connoisseurship, beer tasting, food and beer pairing) courses to campus and local community to generate revenue and cultivate links with local businesses.



Signals of Success One Year In *Brewing and Management Program*

80%

Students with bachelor's degrees or higher

20

Minutes it took program to reach full capacity

7

States with students interested in next cohort

Just one year after launching their A.A.S. in Brewing and Management, **Institution A** achieved exceptional enrollment success, meeting their maximum capacity. The program's first cohort reached capacity 20 minutes after registration opened, and students from seven states have already expressed interest in the next cohort.

Furthermore, Institution A's program solidified its region's reputation as the beer capital of the Southeast. Since the program's launch, several West Coast breweries, including Sierra Nevada and Oskar Blues, opened new facilities in the area.

4) Student and Employer Recruitment

Student Profile

Programs Enroll Industry Veterans and Traditional Undergraduates

Craft beer education programs attract traditional undergraduates preparing for a career in breweries as well as brewers and production line workers who seek career advancement. The average enrolled student is typically 23 to 24 years-old.

Enrolled Student Profile by Program Topic

Demographic:

Student Profiles and Curricular Needs:

Brewing and Fermentation Sciences Programs

<p>Home Brewers</p>	<ul style="list-style-type: none"> Profile: Many home brewers seek employment at craft breweries, but lack the technical experience in commercial brewing equipment and processes. Curricula: Programs focus on scientific concepts, lab analysis, and quality control and assurance. Advanced programs allow students to practice on commercial equipment and instruments.
<p>STEM Undergraduate Students</p>	<ul style="list-style-type: none"> Profile: Chemistry and biology students take interest in the industrial applications of fermentation science and employment outcomes. Curricula: Programs prepare students for industry employment with business courses and for research fields with small batch, laboratory requirements.

Craft Beer Business and Hospitality Management Programs

<p>Production Line Workers</p>	<ul style="list-style-type: none"> Profile: Lower-level production line workers seek promotions to business planning and management positions or wish to launch independent enterprises. Curricula: Programs deliver business courses with a focus on the craft beer industry. Students possess applied experience but require business skills in sales and marketing or supply chain management.
<p>International Students</p>	<ul style="list-style-type: none"> Profile: Developing markets for craft beer such as Ireland and Spain seek trained and specialized workers. <ul style="list-style-type: none"> Considerations: Parents of traditional undergraduate-aged international students require assurance of good employment prospects in the industry. Curricula: Program instructors must convert measurements to metric units, but coursework requires little other adaptation.
<p>Business Students</p>	<ul style="list-style-type: none"> Profile: Marketing and supply chain management students seek to specialize in the craft beer industry. <ul style="list-style-type: none"> Employment outcomes: Institution E program directors report that supply chain management majors in particular secure strong positions in breweries and ancillary businesses such as equipment manufacturers. Curricula: Students require introduction to beer industry.

Student Marketing

Market Programs through Trade Organizations and Industry Publications

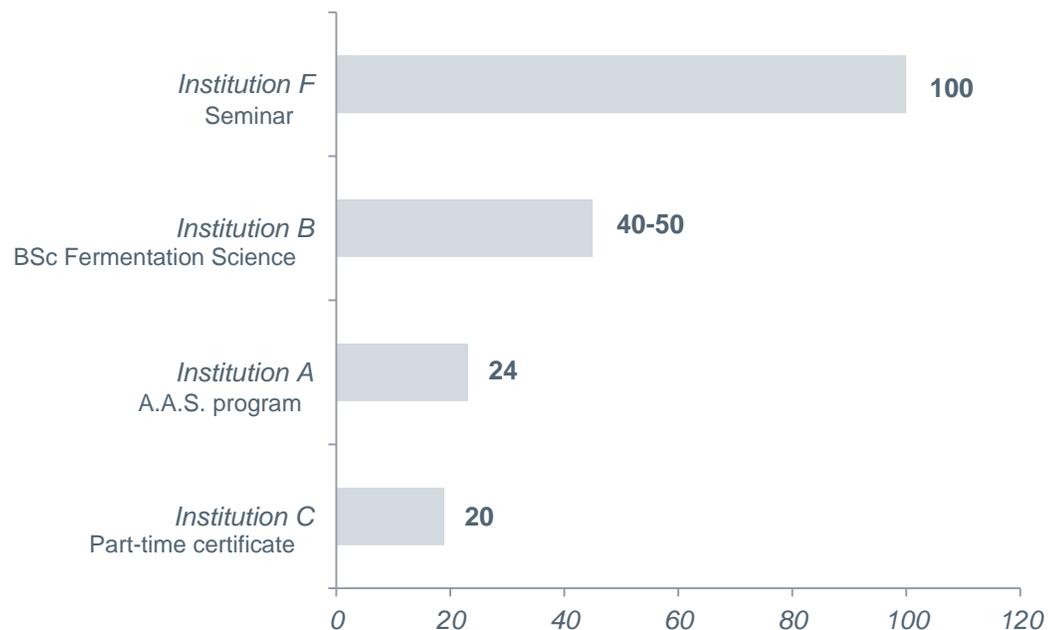
Program directors report little difficulty in student recruitment. Students find potential careers in the craft beer industry attractive; existing brewing science programs at private training institutes and **Institution G** turn away students due to long waiting lists.

Program directors market new craft beer education offerings internally to full-time students and campus staff and externally to industry professionals.

Marketing Strategies

Internal Marketing	Continuing and professional education units advertise certificate programs to full-time enrolled students (e.g., undergraduates in hospitality or chemistry programs, MBA students) through email “e-cards,” table tents in dining halls, printed flyers, and presentations at major fairs. Programs also disseminate information through institutional press releases to attract institutional affiliates and alumni.
Industry Channels	Program directors advertise certificate and degree programs at brewers associations (e.g., the MBAA West District conferences, North Carolina Brewers Guild), industry websites such as craftbeer.com, craft beer festivals, and paid ads in industry newsletters (e.g., <i>Northwest Brewing News</i>).

Student Enrollment at Profiled Programs



Establish Industry Advisory Board and Invite Professional Brewers as Guest Speakers to Connect Local Businesses to Program

Program directors establish relationships with craft beer industry leaders to market the program and connect employers with program graduates. Contacts offer conflicting opinions about the formation of industry relationships; some program staff express frustration over the difficulty to connect with industry professionals and overcome industry skepticism of higher education training, while others describe a warm reception from local breweries. **Institution C** program directors report that Washington state breweries approached institutional faculty to launch a brewing program so that breweries could establish a talent pipeline and recruit from program graduates.

Industry Collaboration Strategies



Convene an industry advisory board. Program staff at **Institution C** assembled local brewers and national distributors (e.g., Iron Horse Brewery, Merchants du Vin) in an advisory committee to oversee the certificate program. Committee members consult on curriculum development, serve as guest lecturers, and offer internships and employment opportunities to students.



Request local breweries host beer tastings to raise program profile. Program directors at **Institution E** host “business briefings” at local breweries, in which certificate students, alumni, and members of the campus community participate in beer tastings while brewery staff deliver lectures about the status of the industry. Course instructors also invite local brewers to distribute beer samples to students in class.



Acquire letters of support from local breweries. Program directors at **Institution A** collected over 20 letters of support from local companies to demonstrate to College administrators that demand existed for program graduates.



Join trade organizations as educational partners. Institutions register beer education programs with the MBAA, the IBD in London, the Craft Beer Alliance, the Brewery Industry Networking Group, and local brewers' alliances and guilds. Program staff attend industry conferences to monitor emerging industry trends and discover what skills gaps employers need filled.

Invite Brewing Professionals to Judge Student Creations

Institution C concludes its craft beer certificate program with a recipe competition. The competition tasks students to develop a commercially viable beer and invites brewers at local breweries to judge student creations. The competition allows programs to cultivate partnerships with local breweries and expose program students to potential employers. Odin Brewing Company and Diamond Knot Brewery and Alehouse served as competition sponsors in past years.

Competition Components



1 Each team of two to three students receives enough supplies for three brews to develop a signature recipe to present. Students name brews and mock up bottle labels to demonstrate the team beer's marketing angle.



2 Program directors invite professional brewers to taste and evaluate teams' final products. Judges vote for a winning beer.



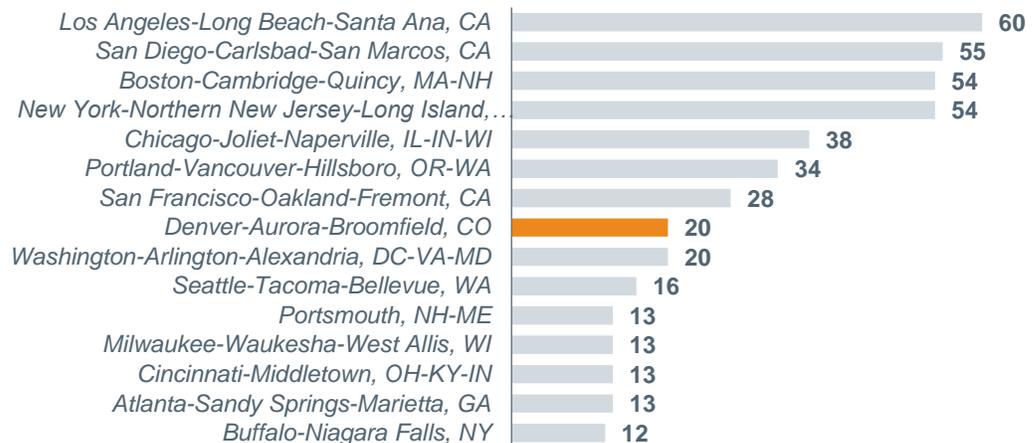
3 A partner brewery brews the winning recipe at a greater scale (e.g., 15 barrels) and distributes the beer to regional bars. The brewery advertises the beverage as made "in partnership with **Institution C.**" The sponsoring brewery rotates every year to maximize industry exposure.

Denver and Colorado Rank among Top MSAs and States for Most Craft Beer Job Openings, Indicating Employers Likely to Partner

California boasts the highest concentration of craft beer positions nationally. The first, second, and seventh top metropolitan statistical areas (MSAs) for craft beer are located in California. The Denver-Aurora-Broomfield MSA ranks eighth nationally among MSAs with the most craft beer job openings and Colorado ranks sixth among top states, well exceeding its position as the 22nd most populous state in the country.

Metropolitan Statistical Areas (MSAs) with the Most Craft Beer Job Openings

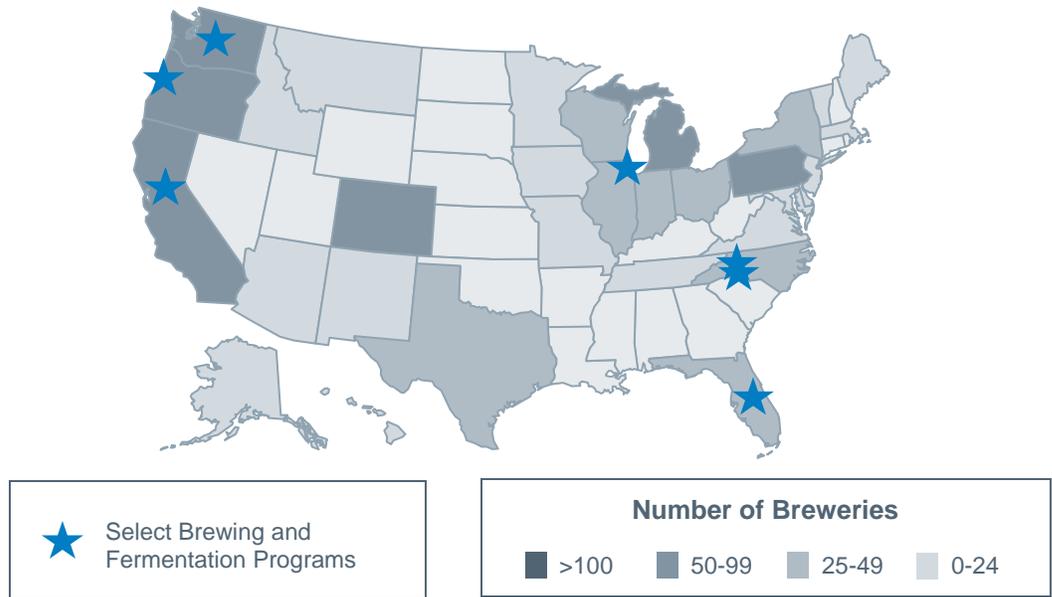
August 2013 – July 2014, National Data



n = 773 with 0 unspecified
Source: Burning Glass Labor/Insight™

Density of Breweries in the Country

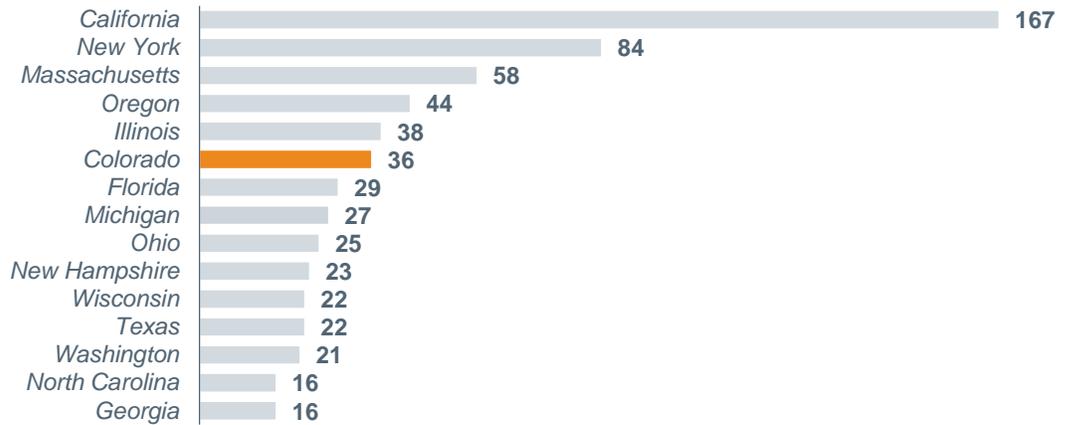
Brewers Association 2012 Data¹



Contacts at **Institution E** also report that other Mountain states, such as Idaho and Montana, experience underdeveloped craft beer workforces. Missoula-based **Big Sky Brewing Co.**, Montana's largest brewery, contacts program directors at **Institution C** to advertise new job postings to craft beer certificate graduates first before distributing the posting to the wider public.

States with the Most Craft Beer Job Openings

August 2013 – July 2014, National Data



n = 773 with 227 unspecified
Source: Burning Glass Labor/Insight™

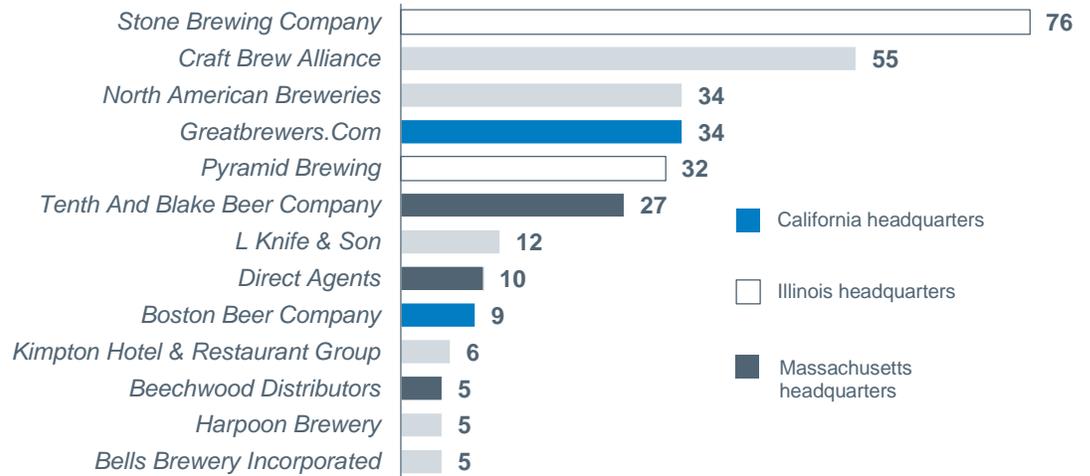
1) Daniel Fromson, "Mapping the Idea of Craft Beer," *The New Yorker*. <http://www.newyorker.com/news/news-desk/idea-of-the-week-mapping-the-rise-of-craft-beer>

Approach Employers with High Demand for New Employees as Partners

Many of the employers that advertise the greatest number of job postings for craft beer operate in California, Massachusetts, and Illinois.

Craft Beer **Employers** with the Most Job Openings

August 2013 – July 2014, National Data



n = 773 with 227 unspecified
Source: Burning Glass Labor/Insight™

5) Student Outcomes

Employment Opportunities

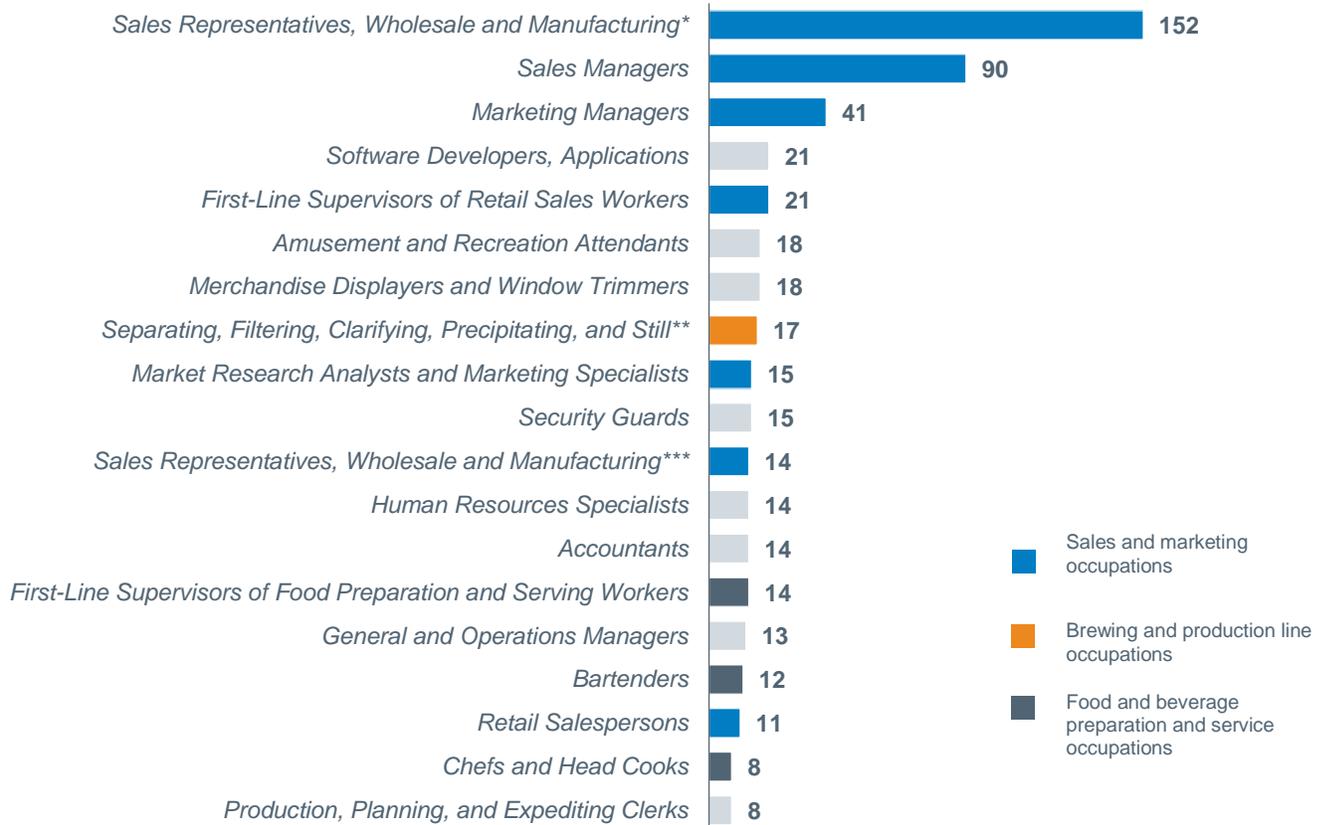
Craft Beer Education Program Graduates Assume Roles in Marketing and Sales, Business Planning, Brewpub Management, and Brewing

Program directors report between 75 and 100 percent employment rates for program graduates. Anecdotally, local craft breweries recruit students as assistant brewers and cellar workers with fast-tracked promotions to brewer and brewmaster. Hospitality management programs report that graduates find employment as brewpub managers and operation managers at breweries.

Online job postings most frequently request candidates for sales positions.

Top Craft Beer Industry Occupations

August 2013 – July 2014, National Data



*Full posting: Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products

**Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders

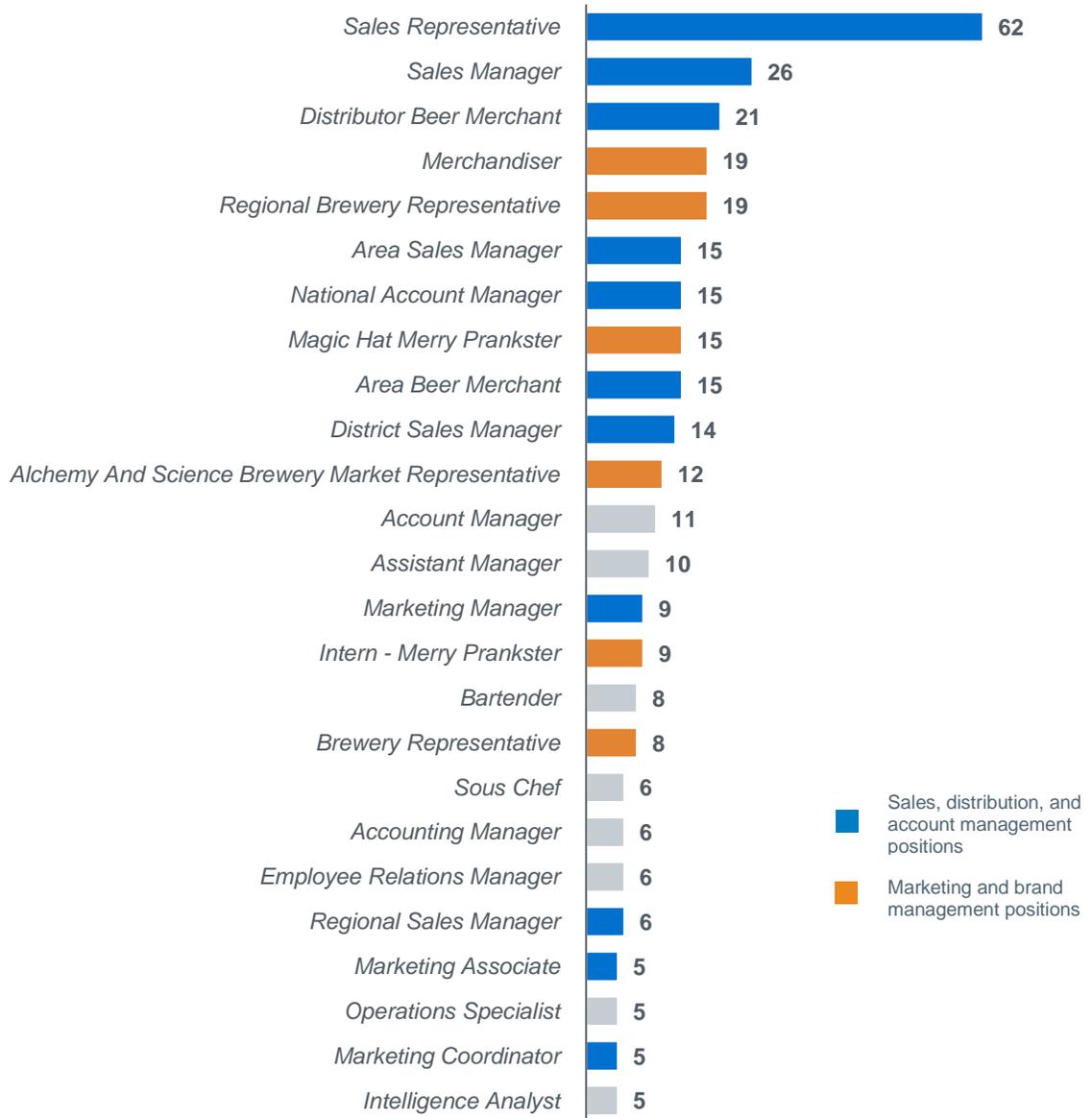
***Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products

n = 773 with 31 unspecified

Source: Burning Glass Labor/Insight™

Top Titles Requested by Craft Breweries

National Data, August 2013 to July 2014



n = 773 postings
Source: Burning Glass Labor/Insight™

6) Research Methodology

Project Challenge

Leadership at a member institution approached the Forum with the following questions:

- On which content areas do competitor programs focus? How do contacts select focus areas?
- How do competitors structure training programs? What credentials do participants receive upon completion?
- To what extent do contacts offer beer industry education programs for academic credit or for personal enrichment? What strategies do academic and non-credit programs employ to recruit students? What existing academic resources did new programs leverage?
- To what extent do contacts deliver training for other alcoholic beverage industries? How do contacts perceive program diversification into other alcoholic beverages?
- What scale of brewery do competitor programs operate to provide hands-on learning opportunities? What additional facilities do contacts require to offer programs?
- How many faculty and staff support beer industry training programs? What qualifications do program managers demonstrate?
- To what extent do contacts collaborate with academic departments to deliver beer education programs? To what extent do contacts collaborate with private industry to deliver beer education programs?
- For which content areas do employers demonstrate the greatest demand? What position titles experience greatest demand in the beer industry? Which skills do beer industry employers most often seek?
- Which employers demonstrate greatest demand for employee training in beer industry topics?

Project Sources

The Forum consulted the following sources for this report:

- Education Advisory Board's internal and online research libraries (eab.com)
- The Chronicle of Higher Education (<http://chronicle.com>)
- National Center for Education Statistics (NCES) (<http://nces.ed.gov/>)
- Fromson, Daniel. "Mapping the Idea of Craft Beer." *The New Yorker*. <http://www.newyorker.com/news/news-desk/idea-of-the-week-mapping-the-rise-of-craft-beer>

Research Parameters

The Forum interviewed program directors of craft beer education programs.

A Guide to Institutions Profiled in this Brief

Institution	Location	Approximate Institutional Enrollment (Undergraduate/Total)	Classification
Institution A	Southeast	8,000/8000	Associate's--Public Rural-serving Large

Institution B	Southeast	16,000/18,000	Master's Colleges and Universities (larger programs)
Institution C	Pacific West	10,000/11,000	Master's Colleges and Universities (medium programs)
Institution D	Midwest	2,000/2,000	Baccalaureate Colleges-- Diverse Fields (for-profit institution)
Institution E	Pacific West	23,000/28,000	Research Universities (high research activity)
Institution F	Southeast	51,000/60,000	Research Universities (very high research activity)
Institution G[†]	Pacific West	27,000 / 33,000	Research Universities (very high research activity)

[†] Institution profiled through secondary sources and publicly available information

Burning Glass Labor/Insight™

Burning Glass – EAB’s Partner for Real-Time Labor Market Data

Part of the data included in this report made possible through our partnership with Burning Glass, a Boston-based firm specializing in use of web spidering technology and Artificial Intelligence engines to mine more than 80 million online job postings for real-time employer demand data. Under the partnership, the Education Advisory Board may use certain features of Burning Glass’s proprietary tool called Labor/Insight™ to answer common member questions about employer demand for specific educational requirements, job titles, and competencies over time and by geography. A fuller description of the tool is available at <http://www.burning-glass.com/products/labor.html>.

Learn about Burning Glass and Labor/Insight™

Many Education Advisory Board member institutions subscribe to the Labor/Insight™ tool, to provide program directors and marketers desktop access to the tool’s full suite of features. Burning Glass is pleased to provide Labor/Insight™ to our members at a substantial discount. For more information about the service, please contact Kelly Bailey, Business Development Manager, kbailey@burning-glass.com or 732-800-2484.

Definition of Terms

The total number of “unspecified” job postings included in a data sample is indicated below all charts and graphs in this report. Job postings are considered “unspecified” for a skill, industry, employer, geography, certification, education requirement, or major when the job posting did not advertise for one of these particular job characteristics and therefore should be subtracted from the total number (n value) of job postings analyzed in the query. Capital cities may be overrepresented in instances where job postings do not specify a location within a state.

Appendix A: Brewing Sciences Programs

Compiled by Master Brewers Association of the Americas Higher Education Committee

U.S. Programs

Institution	Type of Program	Program Category	Location	Status
Appalachian State University	BSc Fermentation Science	4 year	Boone, NC	In operation
Ashville-Buncombe Tech Community College	AA degree	2 year	Ashville, NC	In operation
Auburn University	Graduate certificate	Certificate	Auburn, AL	Fall 2014
Blue Ridge Community College	AA degree in Fermentation Science	2 year	Flatrock, NC	In operation
Central Michigan State	TBD	TBD	Mt Pleasant, MI	In planning
Central Oregon Community College	Certificate	Certificate	Bend, Oregon	In planning
Central Washington State University	Craft Beer Certificate	Certificate (1 year)	Ellensburg, WA	In operation
Colorado State University	BSc Fermentation Science	4 year	Ft Collins, CO	In operation
Colorado School of Mines	TBD	TBD	Golden, CO	In planning
CSU Channel Islands	TBD	Classes	Camarillo, CA	In planning
Drexel University	TBD	Classes	Philadelphia, PA	In planning
Florida International University	Certificate program	Classes	Miami, FL	In operation
Metropolitan State University	Degree in Beer Studies	4 year	Denver, CO	In planning
Michigan State University	Courses in brewing	Component	Lansing, MI	In operation
Morrisville State College	TBD	4 year	Morrisville, NY	In planning
Muskegon Community College	TBD	2 year	Muskegon, MI	In planning
North Carolina State University	Brewing science courses	Classes	Raleigh, NC	In operation
Penn State-Schuylkill	Brewing certificate	Certificate	Schuylkill Haven, PA	In planning
Rockingham Community College	AA degree	2 year	Eden, NC	In operation
Southern Illinois University	TBD	4 year	Carbondale, IL	In planning
South College	Brewing Science Certificate	Certificate (1 year)	Knoxville, TN	In operation

Stevenson University	TBD	2 year	Stevenson, MD	In planning
UC San Diego Extension	Brewing Certificate	Certificate (2 year)	San Diego, CA	In planning
University of Wisconsin	Certificate of Fermentation Science	Component	Madison, WI	In planning
University of New Hampshire	Certificate in brewing sciences	Certificate	Durham, NH	In planning
Virginia Tech	BSc Fermentation Science	4 year	Blacksburg, VA	In planning
Western Michigan University	BSc Fermentation Science	4 year	Kalamazoo, MI	In planning

Canadian Programs

Institution	Type of Program	Program Category	Location	Status
Olds College	Dip. Brewmaster and Management	2 year	Olds, AB	In operation
Kwantlen Polytechnical	2 year Brewing Certificate	2 year	Langely, BC	In planning
Niagara College	Dip. Brewmaster and Brewery Operations Management	2 year	Niagara Falls, ON	In operation
Simon Fraser University	Courses in brewing science	Classes	Burnaby, BC	In operation
Thompson Rivers University	TBD	TBD	Kamloops, BC	In planning
University of British Columbia	Courses in brewing	Classes	Vancouver, BC	In planning