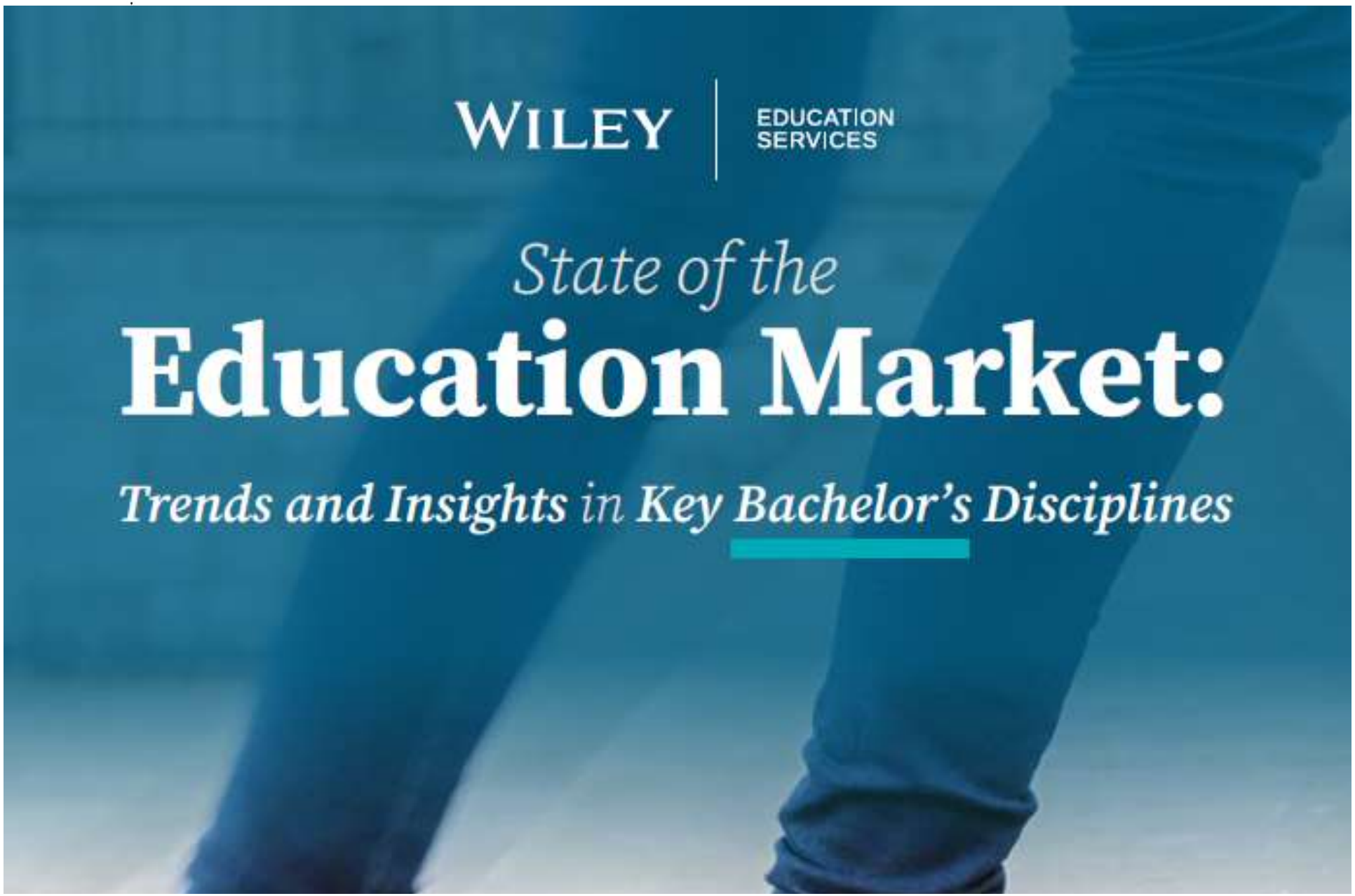
United Nations
Educational, Scientific and
Cultural Organization

UNESCO Chair on
Engineering Education
University of Tehran

2021



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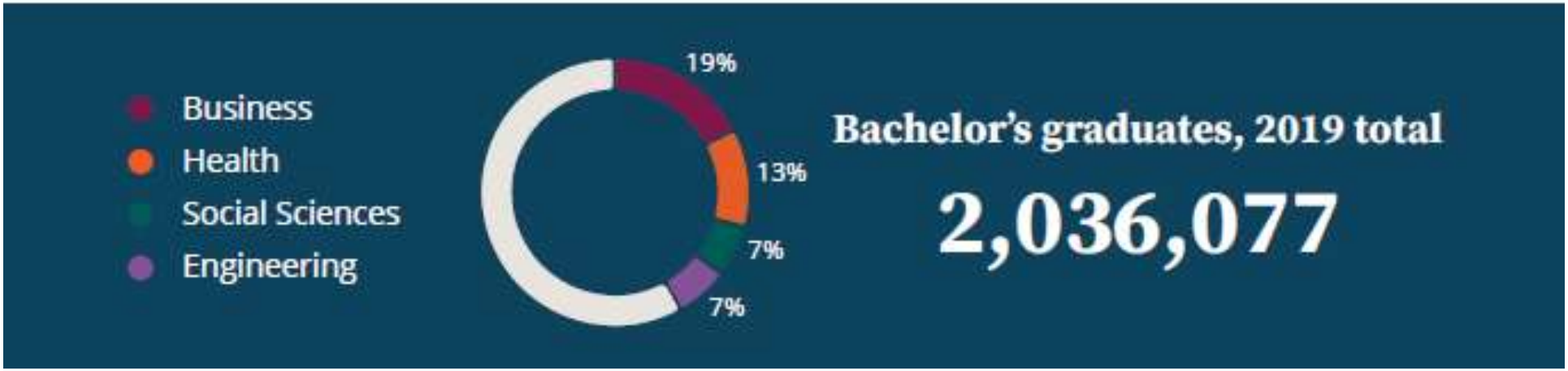
Introduction

Since 2010, the market for bachelor's degrees has grown overall by a brisk 22%. However, not all degree disciplines have enjoyed equal growth. While some have the proven scale and success to thrive over the coming decade, others have been on the decline.

Research Methodology

Data for this report is based on schools reporting graduates (i.e., completed students) and was collected from IPEDS/NCES through the end of the 2018/19 academic year. Completions, while a historical indicator, are available at a level of detail that enables analysis down to the individual degree. Enrollments, by comparison, only provide data at a vertical level and do not permit finely tuned programmatic analysis. The data collected for this report allows for exploration of the four largest undergraduate verticals and the most notable programs within them. These verticals comprise 45% of bachelor's graduates:



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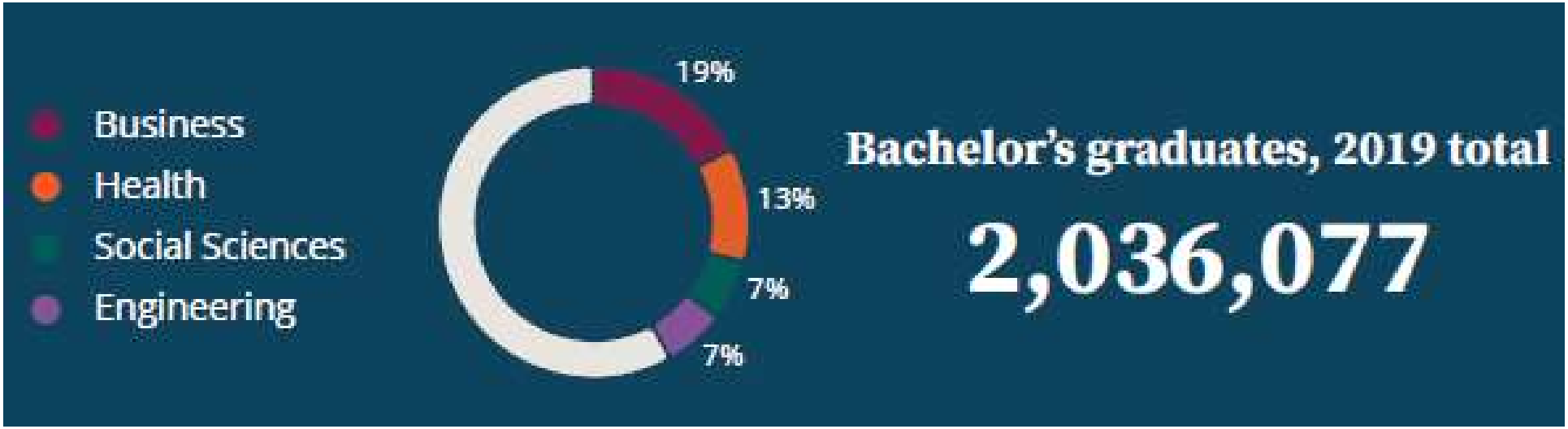
US Bachelor's Graduates 2019



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How to Read This Report

The sections of this report are broken down into four main topics:

1. **General Overview:** A macro view of overall trends in a degree vertical (e.g., business, health)
2. **The Largest Program:** A deep dive into the largest program in each vertical
3. **Biggest, Fastest-Growing, and Shrinking Programs:** A high-level look at some of the biggest, fastest-growing, and declining programs (Icon Legend below)
4. **Programs Spotlight:** Additional context and notable trends for specific programs from each vertical

Icon Legend


Biggest Programs


Fastest-Growing Programs


Shrinking Programs


STEM Programs

Here's how it works:

The base two digits show a general degree. For example, all business degrees are reported using a CIP code that begins with 52.

The next four numbers narrowly define the discipline, while the whole six-digit number represents the specific degree program.

Example: **Project Management**

52.0211

52.0211 Business (general degree)

52.0211 Business Administration, Management, and Operations (degree type)

52.0211 Project Management (specific degree)

Data Definitions

In this data-driven report, the following key metrics are utilized to analyze the higher education market:

- **School years:** These correspond to the end of the academic calendar. For example, the most recent school year in IPEDS is 2018/2019 and is often abbreviated to "2019".

- **Graduates:** This is the total number of students receiving degrees in a given academic year. Unless otherwise specified, the word "graduate" refers to those who have completed their bachelor's degree programs (not master's or doctoral level students, which will be covered in separate reports).

- **Median program size:** This data shows the most standard program size. Median is defined as the most middle value in a list of numbers ordered smallest to greatest. Here it means the most middle program size. Unlike average graduating class size, median is less likely to be skewed by large programs in the market.

- **Percent online:** The number of universities reporting that they offer their program in an online/distance format. This may mean that the program is available both online and on-campus or online-only.

- **Growth:** This usually refers to the average year-over-year increase in graduates from 2014 to 2019 unless stated otherwise.

- **Average program size:** This metric indicates what a given program's typical graduating class size might be. It is calculated based on the number of graduates divided by the number of schools reporting graduates. While each program's class size varies by school, this metric helps reveal if a program is trending toward growth or decline.

Broad Undergraduate Education Trends

Expansion of Online Learning

There's no doubt about it. Online learning is on the rise. The number of bachelor's programs online has grown 67% since 2012—the first year schools reported data about distance learning to IPEDS. Forty-eight percent of schools offered at least one bachelor's program online in 2019. This is up from 33% of schools offering programs online in 2012.

International Students and STEM Reclassifications

Many universities are incentivizing international students to enroll in their programs by reclassifying programs into the STEM category. International students are eligible to extend their F-1 visas up to 24 months if they earn a degree from a CIP code the Department of Homeland Security (DHS) has given STEM designation (see the projected to experience the most growth in the next decade. When high job growth corresponds to a specific degree, it is often called out with a special note called "Labor Forecast."

Bachelor's Completion Programs

Bachelor's completion programs expand options. They are an effective, learner-friendly way of growing enrollments. Schools that allow individuals to transfer in up to 75% of their required credits for completion can help decrease tuition costs and the time it takes to complete their degrees.

The Impact of COVID-19

Adding unforeseen complexity to the state of the market is COVID-19. The pandemic's economic effect on the bachelor's degree market will not be apparent in graduate data for another three years or so. Until then, enrollments will be more of a leading indicator of trends. For instance, preliminary data shows fall 2020 undergraduate enrollment was down .9% year over year[1].

Reclassifications

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Job-Secure Degrees

The most popular degrees align with occupational growth. Business, health, and technology degrees are some of the largest and fastest-growing programs. These programs line up with nursing, management, computer science, and engineering—some of the occupations of the market is COVID-19. The pandemic's economic effect on the bachelor's degree market will not be apparent in graduate data for another three years or so. Until then, enrollments will be more of a leading indicator of trends. For instance, preliminary data shows fall 2020 undergraduate enrollment was down .9% year over year[1].

Now that vaccines are available to the majority of the public, it is imperative that universities quickly and deftly assess which programs they should either seize the moment to launch, keep up the momentum with, or expand as the country begins to synthesize a new normal.

[1] "Current Term Enrollment Estimates," https://nscresearchcenter.org/current-term-enrollment-estimates/

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Engineering Graduates

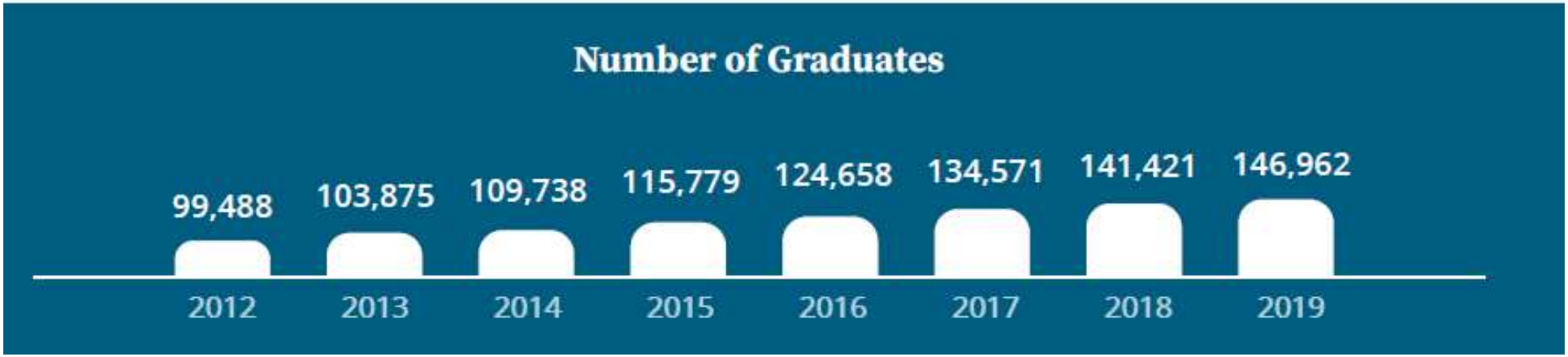
#3 Engineering: *STEM Star*

7% *of all 2019 bachelor grads*

Base CIP Code: **14/15**

Graduates

Engineering is a quickly-growing bachelor's vertical, averaging 6% yearly and 34% overall since 2014. Most growth in the overall higher education market results from programs offered online, but this is not the case in engineering. **This vertical is unique because it is experiencing rapid growth even though it is primarily ground-based.**



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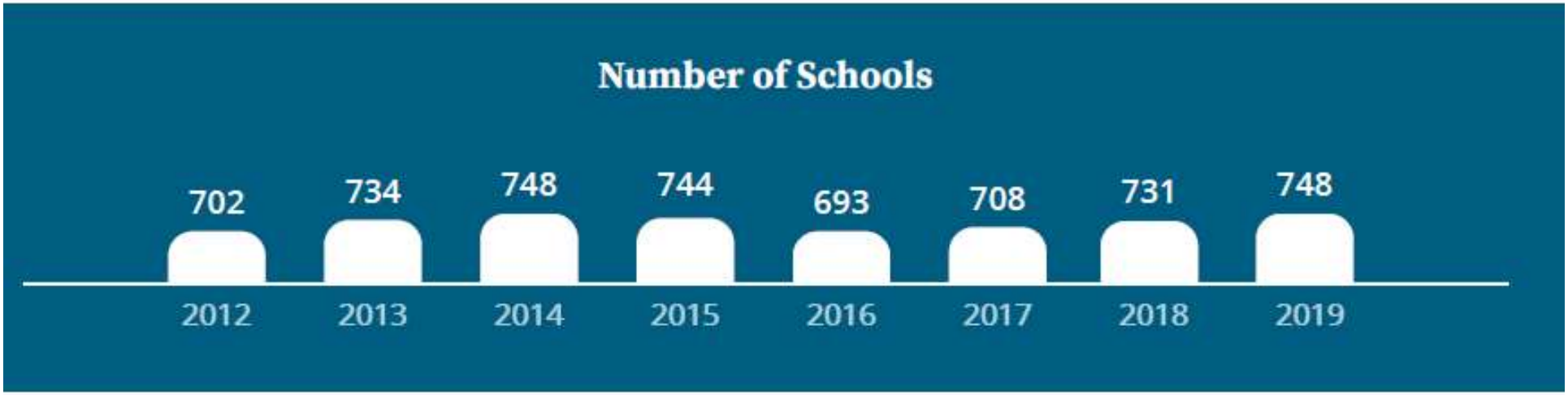
Engineering Schools

Schools in the Market

This vertical has experienced a slight decline in schools since 2016. As in other verticals, this is due to for-profit schools exiting the market. There were 166 of these in 2015 compared to only 37 in 2019. **For-profit schools are now virtually non-existent in this vertical.**



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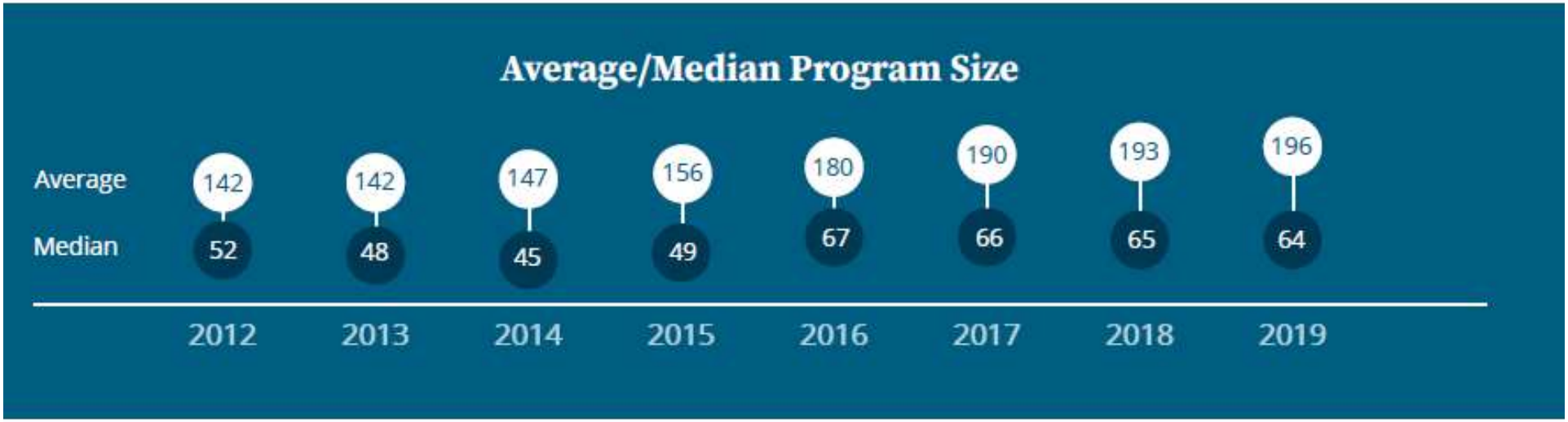
Engineering Program Size

Program Size

Following a decrease in for-profit schools in the market, both average and median program sizes have increased since 2016.



Programs Online

The low percentage of programs online is quite surprising as most programs that grow rapidly have a strong online presence. Engineering is proving to be the exception to the rule.

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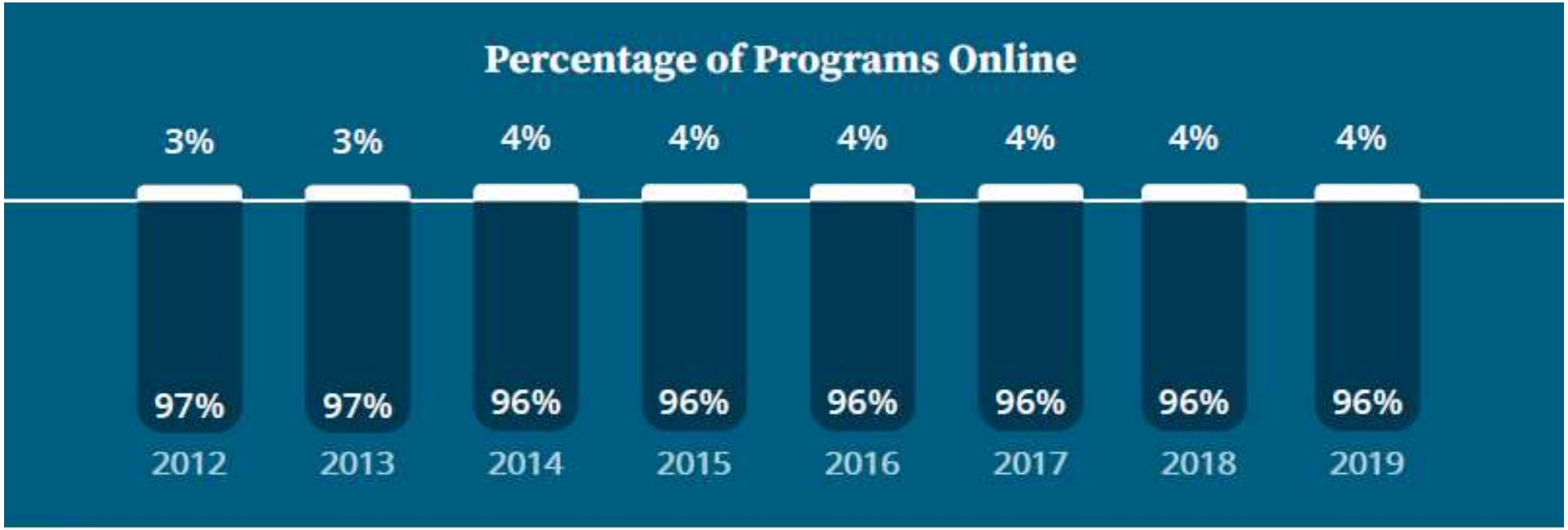
Engineering Online Programs



Undergraduate Engineering Programs With Highest Online Adoption

(min. 100 programs reporting grads)

Electrical, Electronic, and Communications Engineering Technology	Industrial Engineering	Electrical and Electronics Engineering	Engineering, General
9%	5%	3%	2%

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The Largest Engineering Program

Mechanical Engineering 14.1901

This most-popular engineering degree accounted for 29% of all graduates in the vertical. The largest programs are at nationally-ranked public schools (see Graduates by Carnegie Classification), which graduated 79% of all 2019 mechanical engineering grads. Despite this program's large scale, it has very low online adoption. **Only six out of 366 programs were online in 2019.**

Labor Forecast: *Engineering Occupations*

Engineering occupations are projected to grow about as fast as the national average (3.8% through 2029).

37K+	107	9%	2%
grads, 2019	average program size	yearly growth	online, 2019

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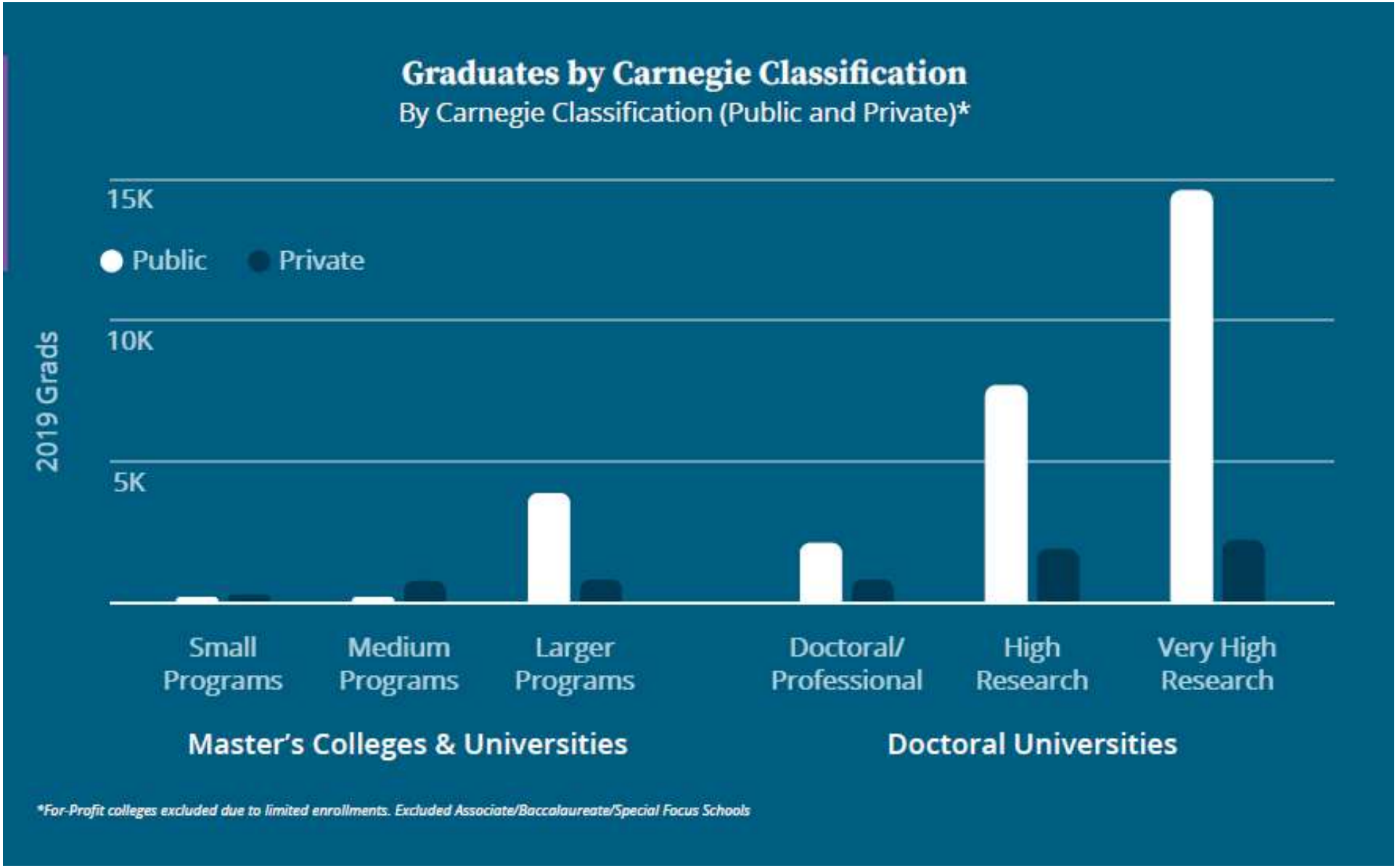

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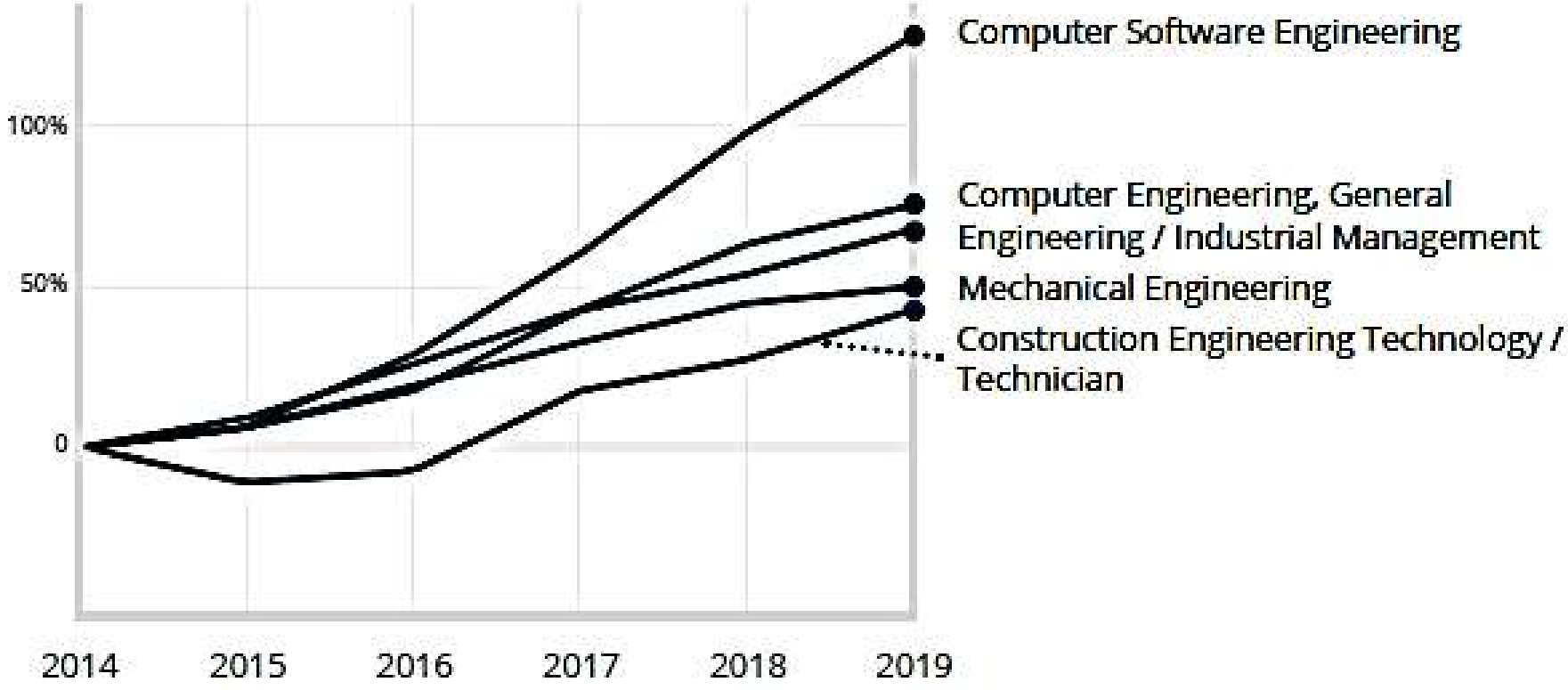
Biggest, Fastest-Growing Programs

Program Icon Legend Biggest | Fastest-Growing | Shrinking | STEM

Fastest-Growing Engineering Programs

Overall growth since 2014



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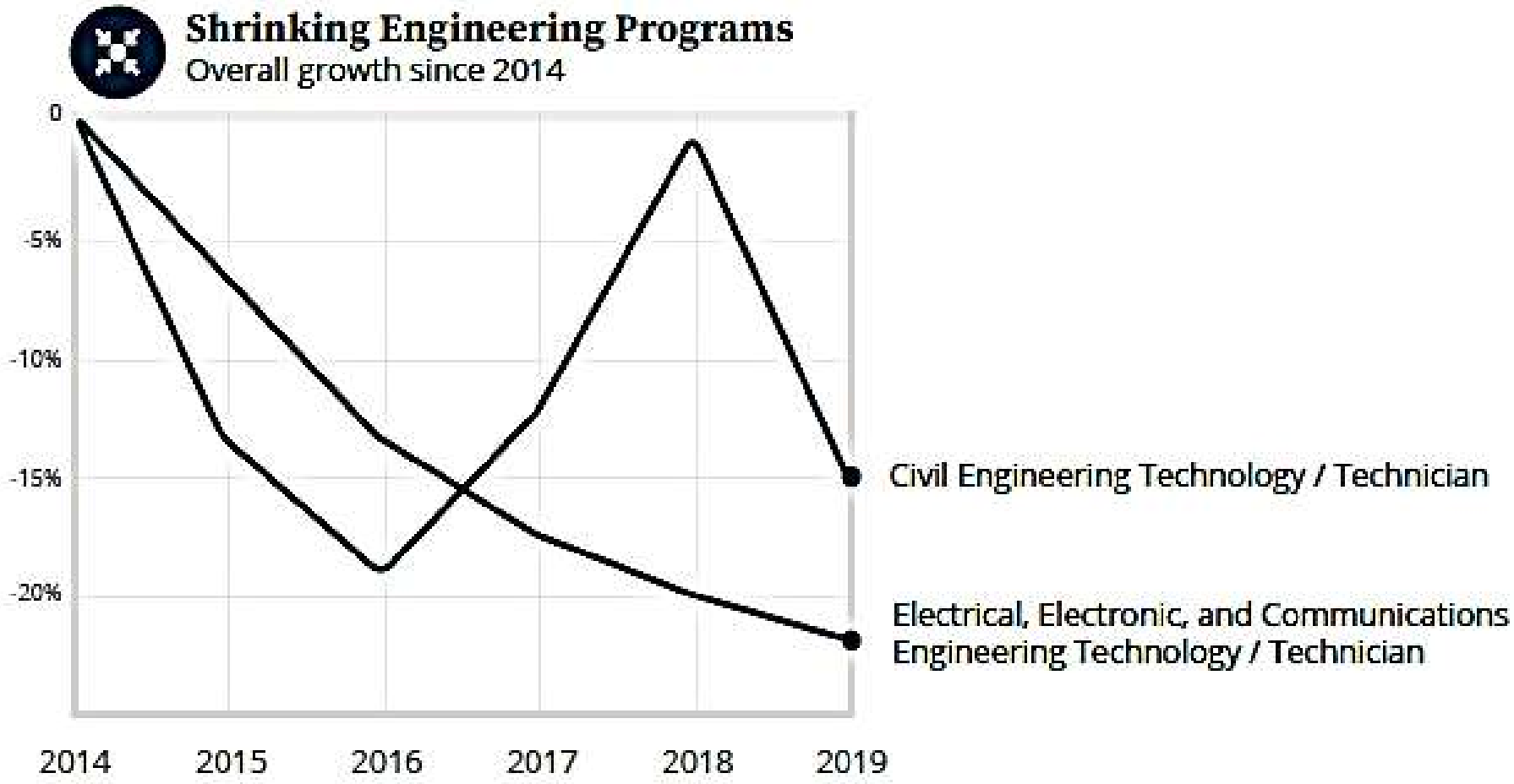
Shrinking Engineering Program



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Chemical Engineering

14.0701

11K+
grads, 2019

68
average program size

7%
yearly growth

1%
online, 2019

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Civil Engineering

14.0801

14K+
grads, 2019

55
average program size

2%
yearly growth

1%
online, 2019

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Civil Engineering Technology 15.0201

453
grads, 2019

17
average program size

-3%
yearly growth

0%
online, 2019

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Computer Engineering

14.0901

8,978
grads, 2019

36
average program size

12%
yearly growth

2%
online, 2019

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Computer Software Engineering 14.0903

1,501
grads, 2019

22
average program size

18%
yearly growth

10%
online, 2019

Electrical, Electronic, and Communications Engineering Technology

15.0303

1,400
grads, 2019

14
average program size

-5%
yearly growth

9%
online, 2019

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Construction Engineering Technology 15.1001

2,373
grads, 2019

46
average program size

8%
yearly growth

5%
online, 2019

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Electrical and Electronics Engineering 14.1001

17K+
grads, 2019

50
average program size

5%
yearly growth

3%
online, 2019

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Engineering/Industrial Management 15.1501

1,215
grads, 2019

23
average program size

11%
yearly growth

25%
online, 2019

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Engineering Programs Spotlight

Computers Are King

In keeping with an increasingly tech-centric world, the fastest-growing engineering degrees center on the application of computers. Computer software engineering is similar to computer science (CIP 11.0701, see "Notable Programs"), with the difference that they each prepare students a little differently. Computer science majors typically focus more on the theory of computational systems and the scientific design of user interfaces. On the other hand, computer software engineering concentrates predominantly on applying computational and mathematical design, implementation, and maintenance.

On the Rebound

Graduate numbers in this program dropped between 2010 and 2015 but have made a comeback since then. This rebound is organic and driven by student interest, not artificial or caused by an increase in schools, which have remained consistent in the same period.