

The degree that built the country

When America has needed more engineers, it has paid for their education. A new index of all 50 states and DC finds the engineering share of U.S. degrees about where it was in 1950, while China's is nearly three times higher.

By the Digital ROTC Coalition, a network of Silicon Valley leaders who believe America needs more engineers. August 2026, figures refreshed October 2026. Data: American Engineering Gap Index v1.5 (IPEDS, 3-yr avg 2022-25, bachelor's degrees; 2024-25 provisional).

We have done this before

Several times in its history, the United States has passed laws that paid for college in order to make the country stronger, and engineering was central to most of them.

In 1862, during the Civil War, the Morrill Act gave every state federal land to fund colleges teaching “agriculture and the mechanic arts.” Purdue, Cornell, MIT and Texas A&M are land-grant schools, and so are many of the largest engineering producers in this index. In 1916 the National Defense Act created the Reserve Officers’ Training Corps on college campuses, and in 1964 Congress added ROTC scholarships: tuition paid in exchange for military service. The GI Bill of 1944 paid for millions of veterans to attend college. By 1950, with those veterans graduating, engineering was 12 percent of all U.S. bachelor’s degrees. After Sputnik in 1957, the National Defense Education Act of 1958 created the first large federal student loan program and forgave part of the debt for graduates who went on to teach in public schools.

The common pattern is that the government lowered the cost of a degree and, in several cases, asked for public service in return.

1862	Morrill Act: land-grant colleges for “agriculture and the mechanic arts” in every state.
1916	National Defense Act creates ROTC on college campuses.
1944	GI Bill pays for veterans’ college. By 1950, engineering is 12% of U.S. bachelor’s degrees.
1958	National Defense Education Act, passed after Sputnik, creates federal student loans with forgiveness for public-school teachers.
1964	ROTC Vitalization Act creates ROTC scholarships: tuition paid in exchange for service.
2000	CyberCorps: Scholarship for Service applies the same exchange to cybersecurity, at small scale.
2026	The Engineering Gap Index: 12.3% of U.S. bachelor’s degrees are engineering + CS. China: 33.2%.

What the index measures, and why the share matters

The American Engineering Gap Index asks one question of every state: of all the bachelor’s degrees you produce, what fraction are in engineering or computer science? It uses the newest federal data, three years of the Department of Education’s IPEDS survey covering every degree-granting institution in the country, and it counts production, not residence: where engineers are trained, not where they end up working.

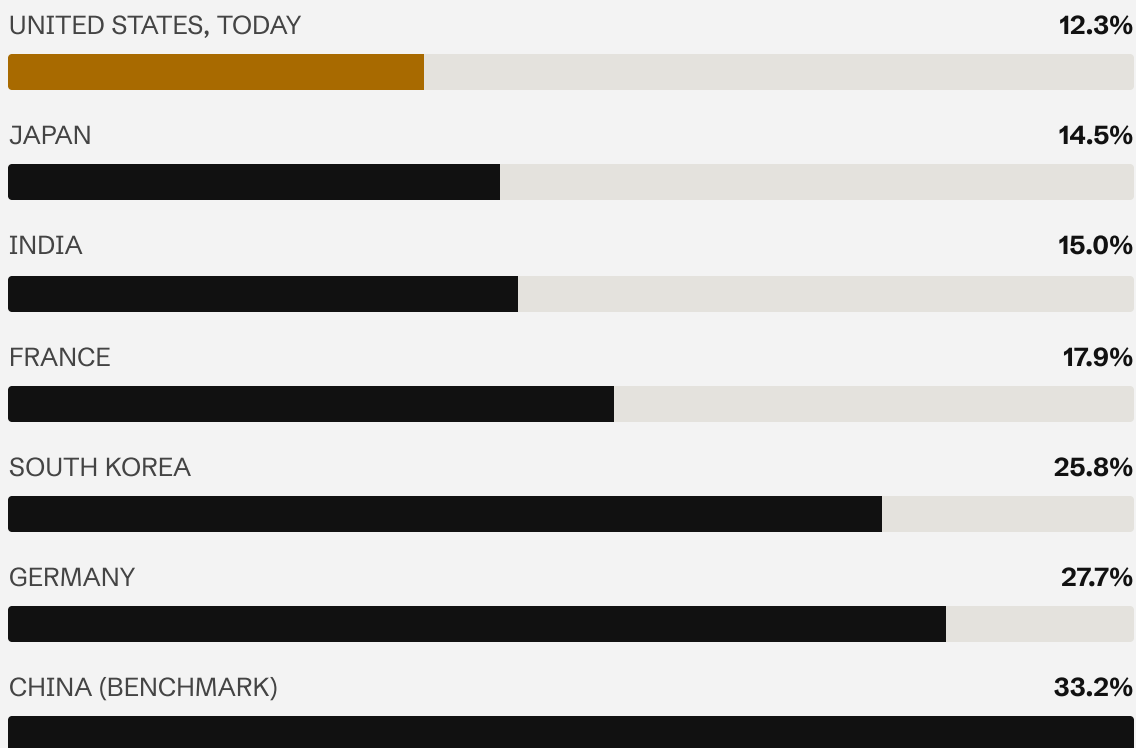
The index uses the share rather than the raw count because the share is the part policy can change. A country’s total number of graduates mostly follows its population and income. The fraction in engineering depends more on what governments and colleges choose to fund and expand.

The national answer is 12.3 percent. America awards about 1.8 million bachelor’s degrees a year; roughly 223,000 are in engineering or computer science. China’s figure, measured the same way, is 33.2 percent: engineering’s share of bachelor’s degrees awarded, computer science included, from the most recent statistics China’s

Ministry of Education has published (2022). The National Science Foundation's independent series puts it at 32.8 percent for 2020. At China's rate, America would graduate about 600,000 engineers a year, about 381,000 more than it does.

Chinese statistics are reasonably questioned, so the index compares degrees awarded to degrees awarded, bachelor's to bachelor's, and also reports two lower benchmarks. At 25 percent the shortfall is 232,000 a year. At 20 percent, below what Germany (27.7 percent) and South Korea (25.8 percent) report, it is 141,000. The United States is below every benchmark in the chart.

Engineering + CS share of bachelor's degrees, benchmarked



At China's rate the United States would award 380,847 more engineering + CS bachelor's degrees a year. IPEDS Completions, 3-yr avg AY 2022-25 (2024-25 provisional). CIP 14 (engineering) + CIP 11 (computer & information sciences), bachelor's degrees. China: PRC Ministry of Education, 2022 bachelor's graduates by discipline, the most recent published (NSF NCSES *Science & Engineering Indicators*, Fig. HED-30: 32.8%, 2020). Germany, South Korea, France, India, Japan: NSF NCSES Fig. HED-30, engineering + CS share of first university degrees, 2020 (CS folded into engineering for Japan, as for China; France's 5-year master's-level engineering diplômes count as first degrees). Exclusively-online national institutions excluded from state totals.

Where the states stand

Maryland leads at 20.9 percent. The University of Maryland, College Park, the University of Maryland, Baltimore County and the U.S. Naval Academy together award about 3,900 engineering and CS bachelor’s degrees a year. Massachusetts, Colorado, Washington and Michigan follow. Georgia ranks seventh, and Georgia Tech alone awards about 3,300 engineering and CS bachelor’s degrees a year, 72 percent of all the bachelor’s degrees it confers. Kentucky, Nebraska, Maine and the District of Columbia rank lowest, at one technical degree in every fourteen to sixteen. California, home of Silicon Valley, is almost exactly at the national average and, because of its size, has the largest absolute gap: nearly 44,000 a year.

STATE	SHARE	RANK	MISSING A YEAR
Maryland	20.9%	1	3,256
Massachusetts	16.1%	2	10,129
Georgia	14.8%	7	10,136
California	12.3%	18	43,897
United States	12.3%	-	380,847
Kentucky	7.3%	48	6,393
District of Columbia	6.3%	51	2,610

Two findings stand out. First, only Maryland reaches half of China’s rate. Massachusetts, in second place, is at 16.1 percent. Second, the national share is rising slowly: from 11.9 percent in 2022-23 to 12.7 percent in 2024-25 (the newest year, still provisional), and twelve states awarded fewer engineering and CS degrees at the end of that period than at the start. At that rate of increase, reaching China’s share would take about 50 years.

The longer record shows the same thing. Engineering alone was 12 percent of bachelor’s degrees in 1950, fell to about 4 percent by the mid-1970s, and is about 6 percent today. Growth in computer science has brought the combined share back to roughly where engineering alone stood in 1950.

Why the degree

Bootcamps, self-taught programmers and AI coding tools are sometimes offered as substitutes for the degree. The numbers suggest they are not closing the gap. The Bureau of Labor Statistics projects about 318,000 openings a year in computer and IT occupations through 2034, most of them to replace workers who retire or change fields. The country awarded about 108,000 bachelor's degrees in computer science in 2021-22. Not every one of those openings requires a CS degree, but BLS lists a bachelor's degree as the typical entry requirement for software developers and for most engineering occupations.

The federal government feels the shortage directly. A 2011 study by the Project On Government Oversight found that contractors cost the government an average of 1.83 times what federal employees doing comparable work cost. The GAO reports that about 80 percent of federal IT spending goes to operating and maintaining existing systems. The H-1B visa cap of 85,000 a year limits how much of the shortfall can be filled from abroad.



One U.S. bachelor's degree in eight is in engineering or computer science, about the same as in 1950. In China it is one in three.

The proposal

Land-grant colleges, ROTC scholarships, the GI Bill, NDEA loans and CyberCorps all lowered the cost of education, and most of them asked for service in return. Digital ROTC applies the same exchange to government technology work. Students take federal student loans to cover two years of engineering, computer science or cybersecurity school at a community college. The loans are forgiven in full after the graduate works 24 to 36 months on government technology teams. Those two years can end in an associate degree or transfer into a bachelor's program, which is what this index measures. Because it uses the existing federal student loan system, the program needs no new agency. Community college keeps the cost low for families who cannot pay for four years away from home.

The national share is 12.3 percent. In 1950, after the GI Bill had paid for millions of veterans' degrees, engineering alone was 12 percent. Digital ROTC proposes paying for school again, through loans that are forgiven in exchange for public service.

The American Engineering Gap Index. Digital ROTC Coalition, a network of Silicon Valley leaders who believe America needs more engineers. v1.5, October 2026. 50 states + DC.

Sources: IPEDS Completions C2023-C2025 (C2025 provisional) + HD2025 + EF2024A-DIST, NCES, U.S. Department of Education; U.S. Census Bureau NST-EST2025; NSF NCSES Science & Engineering Indicators Fig. HED-30 (China first university degrees, via OECD / PRC Ministry of Education); OECD Education at a Glance (Germany); Bureau of Labor Statistics Employment Projections 2024-34 and Occupational Outlook Handbook; NCES *Digest of Education Statistics* Tables 318.10, 322.10, 325.35 and 325.45 (historical shares, 1950-2022); GAO (federal IT O&M share); POGO, *Bad Business*, 2011 (contractor cost premium); Digital ROTC Policy Memo, February 2025.

Historical references: Morrill Act (1862), National Defense Act (1916), Servicemen's Readjustment Act (1944), National Defense Education Act (1958), ROTC Vitalization Act (1964), CyberCorps: Scholarship for Service (2000).

Press & data: write to media@planet10b.com for the full dataset (JSON/CSV), the pipeline code, or a state-level briefing.