

VDE Research: By 2029, the electrical engineering sector will face a shortfall of 30,000 graduates to offset retirements

Declining first-semester enrollment, high dropout rates — and retirements: The shortage of electrical engineers could worsen drastically. A paper by the VDE Committee on “Education, Career, and Society” provides precise figures for the first time.

(Frankfurt am Main, May 20, 2026) By the end of this decade, over 30,000 more electrical engineers will retire than will graduate from universities. A recent paper by the VDE Association for Electrical, Electronic & Information Technologies forecasts that, starting in 2027, the annual number of retirements will be twice as high as the number of graduates: For every 13,100 people leaving the workforce, there will be only 6,523 entering the workforce. “From an economic perspective, this is certainly bad news,” says Dr. Michael Schanz, a representative for the VDE Committee on “Education, Career, and Society” and one of the paper’s authors. “But from the perspective of prospective students, it also shows that those who complete their studies have good prospects on the job market.”

	2025	2026	2027	2028	2029
Degrees in Electrical and Information Technology	7,858	6,806	6,523	6,704	6,674
Retirements	12,000	12,550	13,100	13,650	14,200

For the paper titled “Recalculation of Graduate Numbers and Dropout Rates,” all publicly available data was analyzed, and the relevant parameters of higher education statistics were calculated with the greatest possible precision. However, the figures also show that only about half of all first-year students actually complete their studies. The dropout rate — that is, the proportion of students who drop out of their studies — was around one-quarter at the turn of the millennium, but it has doubled within a single generation. Fewer and fewer young people are

studying electrical engineering, and about half of them drop out during their studies. The fact that other technical degree programs such as computer science, civil engineering, and mechanical engineering are no better off is no consolation — on the contrary.

One reason for the high dropout rate is the transition from high school to college. “Prospective students’ expectations of their studies and of themselves often do not match reality,” says co-author Prof. Dr. Kira Kastell, chair of the VDE Committee on “Studies, Career, and Society” and president of Hamm-Lippstadt University of Applied Sciences. She adds: “Some use their first year of study as a year of exploration and orientation,” says Kastell. Because electrical engineering is usually not subject to admission restrictions, it may therefore be chosen frequently by these groups in particular. More and better opportunities for information and exchange are needed here: “With the ever-increasing range of degree programs and training options, effective career guidance in high school is essential. Furthermore, dialogue between high school and university faculty is beneficial for aligning expectations and making the transition to university more predictable for students.”

Recommendation for the Electrical Engineering Program

What do the findings of the paper mean for the three groups involved — universities, students and graduates, and the employers for whom these graduates will eventually work? The authors, including Thomas Hegger, vice-chair of the VDE Committee on “Education, Career, and Society” advise universities to start by improving their data collection on who drops out of college, when, and why. “In addition, we should continue to promote electrical engineering programs and support students in seeing their studies through,” says Hegger, who works full-time as a human resources consultant (Hegger Riemann & Partner Personalberatung) and holds a degree in engineering himself. His advice to employers is: “Take the coming years into account when planning your workforce!” And addressing students, he says: “The gap between graduates on one side and retirees on the other is so wide that studying electrical engineering remains a clear recommendation, especially in terms of job security. Moreover, electrical engineering is one of the most important fields for the future: the energy transition, e-mobility, digitalization, and artificial intelligence are unthinkable without electrical engineers.”

The figures underlying the paper were compiled by the VDE Committee on “Education, Career, and Society.” They are based, among other things, on the final reports of the Federal Statistical Office (DESTATIS) starting with the 1991 cohort. Due to potential classification errors in the analysis, the completion of the Bologna Process, and new findings regarding transition rates from bachelor’s to master’s programs, the figures were re-researched, updated, and recalculated in many instances.

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The VDE (VDE Association for Electrical, Electronic & Information Technologies) is headquartered in Frankfurt am Main. For more information, visit www.vde.com

Press contact: Matthias Schmidt-Stein, Phone +49 69 6308-398, presse@vde.com