

STEM CAREERS AND SKILLS OF THE FUTURE

The **STEM Alliance** proposes a series of online events (webinars and chat discussions) and career sheets that aim to promote **Science, Technology, Engineering and Mathematics (STEM)** careers with role models. Representatives from companies – partners of the STEM Alliance – are invited to give online and written presentations to inform teachers about possible careers in their companies. The **career sheet** serves as an awareness-raising tool for teachers and career guidance officers, as well as providing valuable information for the companies' own awareness-raising campaigns.

Please do keep in mind that the information in this career sheet relates closely to the context of the professional whose experience the career profile is based on. STEM professions, studies and challenges vary between countries and industry sectors.

IT Teacher

Name and career title:

Peter Bessems, Certified Cybersecurity Specialist, CCNP Security

Peter Bessems (1957) is an experienced information technology (IT) teacher and is living in Helmond, a town in the Netherlands. He teaches at a public technical college with students in the age of 16-22. Many students graduated as Network Administrator mostly in the Netherlands, but some also graduated abroad. He has some examples of great career starts of people. Peter is now over 20 years involved with the Cisco Networking Academy curriculum and his IT certification is up to date.



Short overview of the job:

IT teachers teach students about the principles of technology and how to use basic information technology tools. While Peter Bessems teaches at college level, you can also be an IT teacher at elementary, middle and high schools. At the high school level, they usually teach courses on basic or advanced computer skills. At the college level, IT teachers may teach introductory computing, computer science and programming courses, as well as higher-level classes on specialized topics like discrete structures and software engineering.¹

What does a typical working day look like?

Peter Bessems describes his work as very hands-on, because he lays his focus on learning by doing. In his classrooms, he uses real equipment from companies that don't use them anymore. His teaching methods are often online and involve different approaches as well as individual online meetings with students.

¹ Cf. https://learn.org/articles/What_is_an_IT_Instructor.html

There are various activities over the course of the week: On “Cable Wednesdays”, students go to the room where all the cables and switches are, to get a better understanding of the hardware. Around Christmas, Bessems organises a LAN-party with his colleagues and the students, which is a lot of fun for the entire school.

Generally, there are different tasks involved in the job ranging from planning lessons according to curriculum standards, staying updated with the latest IT trends, performing regular hardware and software updates on classroom IT devices, monitoring student progress through administrating assignments, quizzes, and tests as well as keeping track of student grades.²

Overview of the study path and ways to get into this career:

Bessems started as an IT teacher around 20 years ago and is now a certified Cybersecurity Specialist. He is using the Cisco Networking Academy curriculum and participates in the CyberOps course every week.

As a rule of thumb, IT teachers need a bachelor’s degree in education with a concentration in information technology. An accredited degree program includes a certain amount of observation and student teaching hours, which vary from country to country.³

Degree programs in this field often combine classroom learning with hands-on computer hardware and software training. Common course topics might include probability and statistical methods, finance for IT professionals, telecommunications engineering, data mining, information assurance and risk assessment, network security, cybersecurity policy and cryptography.⁴

What are the key skills needed in this job?

IT teachers need more hard skills and technical knowledge than the average teacher, having to be experts in the most common hardware and software. In addition to these areas of knowledge and traits, the following skills are required to find employment as an IT teacher:

- Planning student lessons based on IT knowledge and understanding of curriculum guidelines
- Delivering lessons to students using smart board expertise and public speaking skills
- Building rapport with students using interpersonal communication skills
- Using patience and conflict resolution skills to maintain classroom harmony
- Analysing student progress based on results of assignments, quizzes, and tests
- Performing updates to hardware, software, networks, and operating systems⁵

² Cf. <https://www.jobhero.com/it-teacher-job-description/>

³ Cf. <https://www.jobhero.com/it-teacher-job-description/>

⁴ Cf. https://learn.org/articles/What_is_an_IT_Instructor.html

⁵ Cf. <https://www.jobhero.com/it-teacher-job-description/>

What types of jobs and industry sectors can you work in?

If you want to become a teacher, you could also consider a job teaching a different subject, such as math or science. Alternatively, if you would prefer a job within the field of information technology, you might consider becoming a computer systems administrator, where you would be responsible for maintaining the network for a business or organization.⁶

What are the main challenges in your job?

In IT, you have to upgrade your knowledge continuously. The better they can use a smart board or online communication tools, the more they can incorporate multimedia into their lesson plans. IT teachers need to be able to think on their feet and to solve basic IT problems under pressure. Since their lessons rely so heavily on technology, they can't teach if there is a hardware or network malfunction.⁷

Is this the job for you?

As a teacher you have to be enthusiastic and motivated. When you create a challenging environment, the talent of the student will be reached in a short time. You also have to be able to engage in close interaction with students and parents to give individual feedback.

Advice to teachers:

Peter Bessems' vision is that students learn better by doing and working with real equipment. Flipping the classroom is a timesaving teaching method for the student to gain knowledge at their own pace. This means that students prepare and do "homework" first. In the classroom you then have more time for practical labs and discussions to reinforce the knowledge of the student. Finally, tests are not just about memorizing but rather about assessing if students really understood the subject.

With his colleagues, Bessems elaborated some guidelines for teaching. A lecture should never exceed 30 minutes. After that it's about demonstrating what students need to do step by step. Bessems also records his lessons so that students can come back to it. His advice is that students should watch these recordings at home. As a teacher you shouldn't use class time to repeat what was in the video. At all times, try to stay active and involve the students as much as possible.

Learn more:

- <http://www.stemalliance.eu/webinar-learning-by-doing-with-cisco-netacad>
- Intro to Cyber for STEM: <http://cs.co/cisco4stem2018>

⁶ Cf. https://learn.org/articles/What_is_an_IT_Instructor.html

⁷ Cf. <https://www.jobhero.com/it-teacher-job-description/>