

# Career Profile: Computer Hardware Engineer

A computer hardware engineer is involved in the design, construction and maintenance and testing of computers and computer-based systems as well as the equipment forming part of the systems. The term hardware refers to all physical aspects of the computer, such as central processing units (CPU's) computer chips, microprocessors, custom integrated circuits, and peripherals such as printers, disc drives, scanners, keyboards, modems and related equipment. S/he may also develop 'embedded' products that use computer technology such as refrigeration equipment, car engines and numerous other applications.

Electrical, electronic and computer engineering are closely related sub-disciplines within the field of electrical engineering. Your specific focus will be on computers and in particular on computer hardware. This is distinct from a computer software engineer who is responsible for creating high quality, robust systems to the user's specification, and who uses various programming languages like Visual Basic, C++, JAVA, SQL and many others to accomplish this.

## Education Requirements

### National Senior Certificate (NSC)

For a career in computer engineering students are advised to select English and Mathematics, and to add to this a selection from the designated subjects. These are subjects that are particularly suitable for tertiary study.

### Bachelor Degree

#### **Bachelor of Engineering – (4 years)**

A four year degree programme that focuses on developing knowledge and skills for entry into careers in the field of computer engineering with special emphasis on hardware.

#### **Offered at:**

- [North-West University](http://www.puk.ac.za/fakulteite/ing/electrical/index_e.html)<sup>1</sup> (Electrical, Electronic and Computer Engineering)
- [University of Johannesburg](http://www.uj.ac.za/StudyInformation/BIng/tabid/2261/Default.aspx)<sup>2</sup> (Department of Electrical and Electronic Engineering Science)

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<sup>1</sup> [http://www.puk.ac.za/fakulteite/ing/electrical/index\\_e.html](http://www.puk.ac.za/fakulteite/ing/electrical/index_e.html)

<sup>2</sup> <http://www.uj.ac.za/StudyInformation/BIng/tabid/2261/Default.aspx>

- [University of Pretoria](#)<sup>3</sup> (Department of Electrical, Electronic and Computer Engineering)
- [University of the Witwatersrand](#)<sup>4</sup> (School of Electrical and Information Engineering)

## Registration as a professional engineer

A person who has obtained a recognised BSc(Eng) or BEng degree is eligible for registration as a Candidate Engineer. After gaining at least 3 years of appropriate practical experience a computer engineer may apply for registration as a Professional Engineer under the auspices of the Engineering Council of South Africa.

## Possible Employers

As computer engineering is used in the great majority of application such as telecommunications, computer networking, cell phone operations, computer system companies, military and transport technologies, entertainment equipment and medical systems, there are many career possibilities.

- Government departments
- Local government
- Banks
- Computer system companies, e.g. Cisco, Dimension Data, IBM, ICL, Microsoft
- Office equipment manufacturing firms
- Cell phone technology, e.g. Cell C, Nokia, Vodaphone
- Engineering consulting firms
- Firms where data and/or communication networks operate

The registered engineer with the necessary experience and initiative can work as a consultant for any of the above-mentioned companies and organisations. S/he can also start her/his own consultancy.

## Find out more

Find out more about careers in computer hardware engineering:

- [University of Pretoria brochure](#)<sup>5</sup> include suggestions about possible career directions.
- [Outline](#)<sup>6</sup> of typical day to day activities of a computer hardware engineer.
- [Job description](#)<sup>7</sup> of a computer hardware engineer.

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<sup>3</sup> <http://www.ee.up.ac.za/main/en/index>

<sup>4</sup> <http://www.ee.wits.ac.za/>

<sup>5</sup> <http://tissuebank.co.za/sitefiles/file/33/Engineering%20Built%20Environment%20%20ITBrochure%20%28final%29.pdf>

<sup>6</sup> <http://careerplanning.about.com/od/occupations/p/comphardwareeng.htm>

<sup>7</sup> <http://www.careerplanner.com/Job-Descriptions/Computer-Hardware-Engineers.cfm>



- The [Association of Computer Machinery\(ACM\)](http://computingcareers.acm.org/?page_id=15)<sup>8</sup> provides a list of skills you will learn when studying computers.
- A comprehensive [list of computing companies](http://www.compustaff.co.za/it-company-lists.asp)<sup>9</sup> in South Africa.

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<sup>8</sup> [http://computingcareers.acm.org/?page\\_id=15](http://computingcareers.acm.org/?page_id=15)

<sup>9</sup> <http://www.compustaff.co.za/it-company-lists.asp>

## Are you suited to this career?

This quick quiz can help you to identify whether you are suited for this occupation.

Quiz	Yes	No
Are you eager to learn and be inventive in applying what you learn?		
Are you good at Mathematics and Science?		
Are you keen to explore the inner workings of computers?		
Are you interested in and good at solving problems?		
Do you enjoy detailed and precise work?		
Does the challenge of working in a dynamic, rapidly changing environment excite you?		
Do you think logically?		
Can you communicate well in speech and in writing?		
Are you able to work with other people and on your own?		
Do you have good eyesight and eye-hand coordination?		

If you have mainly yes answers it may be an indication that this is an occupation to consider.