Computers

Computer Software Engineers: Applications

Computer Software Engineers design and develop software. They apply the theories and principles of computer science and mathematical analysis to create, test, and evaluate the software applications and systems that make computers work.

They sometimes specialize in particular areas, as in the case of computer applications software engineers who analyze end users' needs and design, construct, deploy, and maintain general computer applications software or specialized utility programs. These workers use different programming languages, depending on the purpose of the program and the environment in which the program runs. Some software engineers develop packaged computer applications, but most create or adapt customized applications for business and other organizations.

Computer software engineers normally work in clean, comfortable offices or in laboratories in which computer equipment is located. Most software engineers and programmers work 40 hours a week and long periods are spent in front of computer terminals, making them susceptible to eyestrain. Software engineers who work for software vendors and consulting firms frequently travel to meet with customers. Lately telecommuting has become more common, as technological advances allow more work to be done from remote locations.

Education/Training

How to Obtain:

Applications Software Engineers positions usually require the completion of a Bachelor's Degree (BA/BS) program, generally in computer science, software engineering, or mathematics. Employers look for applicants with a broad knowledge of, and experience with, a variety of computer systems and technologies. A Master's Degree (MA/MS), in one of these fields may be required for some more complex jobs or for career advancement (completion time is generally 2 years).

Certification programs are generally offered by product vendors or software firms, which may require professionals who work with their products to be certified. Voluntary certification also is available through various other organizations, such as the Institute for Certified Computing Professionals (ICCP) and the Institute of Electrical and Electronics Engineers (IEEE).

The ICCP offers the Certified Computing Professional (CCP) designation. To earn this certification, a candidate must:

- Pass the core exam and

- Pass two specialty exams.

Examples of specialty exams include:

- Information Systems - CORE
- Business Information Systems
- Business Process Management
- Data Management
- Database Administration
- Data and Information Quality

IEEE offers the Certified Software Development Associate (CSDA) designation. To earn this certification, a candidate must pass the CSDA exam.

Major product vendors and software firms offering certification include, but are not limited to Microsoft and Novell.

- Microsoft: Microsoft Certified Applications Developer (MCAD). This certification requires a candidate to take and pass three exams.
- Novell: Novell Certified Engineer Enterprise Services (NCE ES). This certification requires a candidate to take and pass one exam.

More Information on Certification:

- ICCP Certified Computing Professionals (CCP): http://www.iccp.org/iccpnew/ccp.html
- IEEE Certified Software Development Associate (CSDA): http://www.computer.org/portal/web/certification/csda
- Microsoft Certified Applications Developer (MCAD): http://www.microsoft.com/learning/en/us/certification/mcad.aspx#tab2
- Novell Certified Engineer Enterprise Services (NCE ES): http://www.novell.com/training/certinfo/nce/

Average Costs:

Tuition and fees for a master's degree earned at a public university in an area like computer science, software engineering, or mathematics costs an average of $12,800 per year*. Completion time is generally two years.

Total Cost of Certification Exams, not including the cost of exam study aids:

- ICCP Certified Computing Professional: $855

- IEEE Certified Software Development Associate (CSDA): $295 - $395
- Microsoft Certified Applications Developer (MCAD): $375
- Novell Certified Engineer Enterprise Services (NCE ES): $125 - $195

*Note: This figure does not include federal, state, or university financial aid resources such as grants, fellowships, scholarships or work study. It also does not include vocational rehabilitation or other state resources available specifically to people with disabilities. Out-of-pocket expense may be significantly less.