

# Keys to Computer Certification Success: How to Get (Happily) Certified

BY ANNE MARTINEZ



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## Keys to Certification Success

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# Preface

For Computer Professionals, professional certification can be a substantial stepping stone to career success. The right certifications can boost income and/or open doors to new career opportunities. The process of achieving certification can also be personally satisfying, challenging, and rewarding.

The path to certification can be time consuming and expensive, but it doesn't always have to be. This book, *Keys to Certification Success*, has been written to help you achieve the most worthwhile certification in the most efficient manner.

In Chapter 1: *The Quick FAQs*, you'll get the answers to your immediate questions about computer professional certification. I'll explain how many certifications there are, how certification can help your career, what certification is most commonly used for in a career, and much more. In Chapter 2: *Which Certification is Best for You*, I'll help you sort through the forest of computer certifications and determine which ones are worth your personal time and effort. In Chapter 3, you'll learn about the available study options so you can choose those that are most convenient and effective. In Chapter 4, I'll help you define and plan your certification budget, as well as discuss tips for cutting your certification costs. Chapter 5: *How to Study*, is a refresher course on effective study habits, from when to study to how to remember material that you cover. Chapter 6 covers the ins and outs of test-taking techniques, so you

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can get the score you deserve on the big day. Chapter 6 reviews the most popular certification programs, so you can learn which certifications are leading the way in which areas.

Earning certification will show evidence of your technical skills and competency. It will also demonstrate your desire to excel, to be one of the best in your field. These are characteristics that will serve you well as you pursue your career goals in the computer profession or any other field.

# Chapter 1

## 10 Quick Certification

### FAQS

#### 1. Why get certified?

There are many important reasons to consider earning a professional certification. Certification isn't just another nice thing to have on your resume, although that, of course, is one of its primary uses – to demonstrate to potential employers that your skills have been tested and measured by an independent agency and meet or exceed defined professional standards. But certification is more than a way to credential your current expertise.

Because the computer profession is a rapidly evolving field, IT professionals must always be learning. But determining what to study next and what you really need to know about it can be confusing. That's why many professionals use certification as a blueprint for learning about new technologies. A certification comes with a well-defined, carefully spelled out list of objectives that tells you what you need to know to be competent (or even expert) in a particular technology area. This can be just what you need to move into a new field or simply add new skills in a



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current area of expertise.

Many computer professionals see certification as a personal challenge, a rewarding test to see if they can measure up against their peers and meet or exceed the standards set by an industry recognized entity. They justifiably take pride in every test they pass.

For employers, certification doesn't just credential expertise, it also shows that you have the desire and ability to stay current in a fast moving field. It demonstrates the drive and desire to excel, and the persistence to plan and complete the necessary steps to do so.

## 2. What does certified mean?

Getting certified does not mean that you simply have a nice piece of paper to frame and hang on the wall. It does not mean that you attended class and received a certificate at the end. And it definitely does not mean that you paid a fee, submitted an application, and received a certificate.

True certification requires testing and validation of skills. It means you've taken and passed one or more supervised tests measuring your technical expertise. It means the tests were developed with care to cover the subject area domains appropriately. It means you've measured yourself against defined standards and met or exceeded them. Certification is something to be proud of.

### 3. How many certifications are there?

Currently there are over 500 individual computer certifications to choose from, offered by 120 different certifying organizations.

### 4. How much does it cost to get certified?

The cost of achieving certification varies greatly from title to title and even between two people earning the same title. You can expect to pay exam fees, which typically cost \$125 to \$150 per test. You'll probably also need some kind of preparation or training. It might be as simple as purchasing a self-study book for \$45 or as complex as attending a weeklong boot camp that costs several thousand dollars. The preparation cost is dependent on your current degree of expertise, as well as your learning style.

If you're an expert in a particular product, you may be able to take the exam and achieve certification for a total cost of \$125. Most likely your cost will be higher. And the more advanced the certification, the greater the preparation and testing costs will become. You can easily spend thousands of dollars earning a premiere certification like Microsoft's MCSE or Cisco's CCIE, but those are real coups to have on your resume.

### 5. How long will it take to get certified?

Once again, this is heavily dependent on the certification you choose and your current degree of experience. It

possible to brush up on a narrow subject and take the exam within a week or two of beginning to study. Generally, you can probably expect to spend a month per exam in preparation. If you're a dedicated student you may be able to progress faster. If it's a really high end exam, like Cisco's CCIE lab exam, you'll have to spend multiple months preparing.

## 6. How long will my certification be valid?

Some certifications are valid forever and never have to be updated or renewed. Many, however, will require periodic updates. Usually this means taking a single update exam, or sometimes several update exams. Certification vendors want you to remain certified, so there is usually several years between renewal dates. Some certifications are tied to a particular product version, so when a new version comes out, if you want to be certified on the latest, you'll need to update.

## 7. Which certification(s) should I earn?

The choice of a certification is an important one, which is why it's covered in detail in Chapter 1. Basically, you need to choose a certification that matches your current career goals – either to expand into a new area of technology or to gain credentials supporting skills you already have. You shouldn't choose whatever's hottest at the moment if it's completely unrelated to your job functions or future career plans.

There are certifications at multiple levels of expertise. A

common structure is a three-tiered program, starting with basic certification and ending at expert level. In this case you would start at the bottom level, and earn your first certification relatively quickly. From there you would move up along the same track.

### 8. Where can I get training?

There are many options for certification training. You can self-study with books and computer based training software bought online or you can attend a technical training school or intensive “boot camp.” For the larger certification programs such those from Microsoft and Cisco, you will also have the option of completing coursework at a local community college.

### 9. How will I know what will be covered on the exams?

Each certification vendor maintains a detailed list of objectives for each exam. In fact, if you run into a certification vendor that doesn't do that, you probably should reconsider whether that is an appropriate certification to earn.

The objectives will detail the subject areas as well as individual tasks within those subject areas. Most training products will closely follow these objectives.

### 10. What are certification tests like?

Certification tests come in one of two formats: computer-administered or hands-on practical exams. In some cases a

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certification will require you to pass both a computer-based exam and a practical exam.

Because it is possible to make them more widely available, the most common format is the computer-administered exam. For these exams, you will go to a testing center (there are several large chains) and be assigned to a computer. The test will include many multiple choice questions, some drag and drop, and increasingly, simulations where you will be asked to perform a particular task rather than answer questions about it.

When taking computer-based exams, you may encounter adaptive testing. Adaptive testing is used in an effort to more closely pinpoint skill level using the fewest number of questions. This is partly to speed up the test, but is also done for test security, so that each test taker sees (and can potentially remember and report) fewer questions.

Hands-on practical exams are quite different. For a practical (or lab) exam, you will have far fewer testing locations to choose from. You will most likely need to travel to the testing location, which will have the relevant hardware and software set up for the exam. There you will be assigned tasks to perform, such as installation, administration, and troubleshooting. Hands-on exams are usually associated with the higher level certifications.

## Chapter 2

# Which Certification Is Best For You?

When determining which certification will do the most for you, you could choose the most widely known, one that's related to the hottest skill on the market, or the program you received promotional materials for in yesterday's mail. But all of these are risky methods that may leave you less than satisfied with the results. That's because certification achieves its greatest value when linked with individual experience and career goals.

No certification is going to boost your career to new heights if it doesn't fit with what you've already done and what you hope to accomplish. It doesn't matter if the person in the next cubicle can't stop talking about a particular certification she just obtained--that same program may be a dismal disappointment for you. Or it could prove to be the perfect choice.

You could just go for it and hope for the best, but if you like to gamble, you might be better off purchasing lottery tickets. You could buy a whole lot of them with the amount of money certification will cost you. The certification marketplace isn't like the lottery. You can analyze the lottery for days and be no closer to picking the jackpot numbers, but if you put that same analysis into choosing a

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certification, you're almost guaranteed to come out a winner.

The following six steps will help guide you through the process of selecting a certification that will serve you well. You may want to come back to this section again if at some point in the future you decide to add additional credentials to your collection. The steps are:

1. Identify your employment goals.
2. Consider the amount of resources you're willing and able to expend on certification.
3. Make a preliminary list and contact the certification sponsors for details.
4. Research the real-world potential of the certification.
5. Evaluate the results of your research and select your certification.

## Identify Your Employment Goals

The first step is to carefully consider what kind of work life you would like to have. This goal identification section assumes that the computer profession is where you want to be. If you suspect this isn't the case, consider a visit to a career counselor, who can help you through a more extensive career evaluation.

Assuming you've decided that, at least for now, computers are your thing, let's continue. It's important to note that the question to ask yourself first *isn't*: "What do I want to get out of certification?"

Certification can be used to advance on a current career path, or to switch to a somewhat different or even entirely

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new career path. Which do you want to accomplish? It's important to decide before you start. At the same time, keep in mind that plan you're developing won't be set in stone. You aren't required to adhere to it for life. You can change it (and likely will) at some point down the line.

## Determine Your Available Resources

After you've identified the goals you want to use certification to achieve, and before you set your heart on a particular designation, it's a good idea to determine what you're willing to commit to in order to obtain certification. The three resources to consider are time, money, and effort. How much of each you're willing to invest will have a big impact on your choice of certifications. If you have a plentiful supply of all three resources, then you can skip this section. Otherwise, it pays to give the issue some thought. Some programs will require substantial amounts of all three resources; others can be obtained with significantly less commitment.

### TIME

Achieving certification takes time: time to study, time to sit for exams, and time to attend classes. Think about how much of this increasingly precious resource you have available. Will you be able to study on your lunch hour? Is your boss likely to give you time off to sit for exams or will you have to schedule them on evenings and weekends? How much are you willing to cut back on your social/personal life while you focus on professional advancement? Remember to consider the needs of your family members as well.



### MONEY

Certification runs from a few hundred dollars to well into five figures. How much money do you have available, and how much of it are you willing to part with? Your total cost will depend on the certification and the training methods employed.

When considering the amount of money you're willing and able to spend on certification, don't make the mistake of looking at cash outlay alone. Certification is an investment in your career. The price of an investment only becomes meaningful when you look at it *in relation to expected benefits*. Consider a cost of \$10,000. That's a lot of money. But what if it enables you to earn an extra \$50,000 over the next five years, changes your work from draining to fulfilling, or pays off in other ways important to you? It may suddenly become a much more reasonable figure.

### EFFORT

Think of effort as directed energy. How much of your energy are you willing and able to focus on obtaining certification? Are you the type of person who easily immerses himself for extended periods? Do you enjoy the process of learning and studying, or are they low on your list of preferred activities? Drawing on your past experiences and personality, try to determine if pursuing certification is likely be a pleasure or a task. If it will be a task, how are you at buckling down and sticking with such things? Do you think you'll be willing to keep at it for six months? A year? Or only a week?

## Make a Preliminary List

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If you've followed along this far, you've identified your goals and considered the quantity and types of resources you're willing to commit. Now, just which certifications should you consider? No doubt a number of possibilities have started circulating through your mind. It's time to take everything you've learned up to this point and use it to create a list of certifications that make the first cut.

To create your list you're going to browse through the certifications detailed on the [GoCertify.com](http://GoCertify.com) Web site. Other Web sites may also list certifications of interest to you, but [GoCertify.com](http://GoCertify.com) is the most comprehensive listing of computer certification information available in one place.

When seeking out certifications, you can browse through the offerings of each certification vendor and view those that sound likely, however, you are likely to find the free Certification Counselor a more useful method for building your first list. It was created to simplify the process of identifying relevant certifications from the hundreds available, and uses your current goals and skill level as guidelines.

To use the counselor, visit  
<http://gocertify.com/advisor/advisor1.shtml>

Once you have a (very preliminary) list, read over the descriptive information of each certification to understand the nature of the designation and to see if it relates to your goals. If it looks like it might, check over the requirements more carefully to see what would be involved in obtaining it.

- \* If you're aiming to improve your work status at your current job, you should be looking at certifications

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that are related to the work you already do or, at least, that your company does. These would include product-specific and vendor-independent certifications.

- \* If you intend to use certification to move into a new specialty, focus on certifications related to that specialty.
- \* Choose only certifications with requirements that can be met within the time, money, and effort restrictions you've identified.
- \* Pay attention to how long the certification has been offered and how many people have earned it in that time. A program that's been in existence for some time but has few takers may not be a good choice.

Keep in mind the goals you've defined and the resources you're ready to commit. Remember, this is a preliminary list, so don't be too discerning. Add any certifications that appear to have potential to your list.

When your list is complete, contact the sponsor for each certification and request that current information be sent to you. You may be able to find the information you need on the sponsor's Web site, which you can link to from GoCertify.com. However, sometimes certification Web sites are not as complete as they could be, so don't hesitate to call or email the certification sponsor if you can not find the information you need online.

## Research the Certification's "Real-World" Potential

The materials you receive from any certification sponsor

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will paint a decidedly biased picture of the value of the program. That's because the materials are designed to sell you on a particular program's merits. Nonetheless, you will probably be able to use them to trim down your preliminary list to a few finalists.

As you study the materials, you may develop gut feelings about certain certifications. If a particular program just doesn't seem substantial to you, cross it off your list. If it involves a lot more hoops than you're willing to jump through, exclude it, too. Keep an eye out for curriculum changes that make a program more attractive than you originally thought.

The wise certification shopper only uses marketing materials as a starting point. Check out what other professionals think of the certification. If the sponsor has a database of certified professionals as part of a Web site, browse through it and contact some of the people listed within. Ask them what benefits they've gained from the certification, and ask if it's lived up to their expectations. You can also call the sponsor and ask them to provide you with a few references. Be aware, though, that if you let the sponsor choose the references, you risk being directed only to especially satisfied individuals.

You can also check online computing publications. One good place to check is a site called [TechWeb](#). This is a central index of computer articles published by CMP Media, which puts out *InformationWeek*, *Network Magazine*, *InternetWeek*, and other industry publications. From here, you can search for any mention of certifications you are interested in. If you're lucky, you'll turn up an article or two that will provide you with some extra information.

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Other places to check include certification-related Web pages created by individuals. The content of these ranges from a single page to in-depth multipart sites that include discussion boards and forums. They're a good place to connect with other professionals who are interested in certification and have some experience with it. You can uncover such sites by using one of the search engines, such as Google or Yahoo!, using the name of the certification as your search criteria.

Finally, consider contacting a few recruiters to ask them what they think of the certification's value. Do they have employers asking for it by name? A yes is a big plus, but don't write a certification off just because a recruiter doesn't know anything about it. The certification marketplace is still developing, and many of the programs are fairly young. Employers and recruiters don't know about all of the designations currently available.

## And The Winner Is

By the time you've finished researching your certification list, both on and off the Web, you should have developed a pretty good picture of each program. Before making a final decision, review your work to refresh your memory regarding your career self-assessment. Keep in mind that up isn't the only direction a career can move. A lateral change can be equally valuable. Don't be swayed by other enthusiastic professionals. Remember that what works best for you may well be different than what they found successful.

If you're having trouble choosing, you may find it helpful to put your thoughts in writing. Write the title of each of

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the certifications you're finding it difficult to choose between on separate pieces of paper. Then write down the pros and cons of earning each certification beneath its title. Read and compare the pages, keeping in mind that there is no one "best" certification, only a certification that is best for you.

# Chapter 3

## Understand Your Study

### Options

Not that long ago, study choices consisted of sitting in a nearby classroom or studying by mail. Now there's a much more plentiful and varied supply of study options and training vendors. Many of them are directly focused on certification training. Current learning alternatives include:

- \* self study books
- \* online instructor led training
- \* online self-paced training
- \* online access to virtual computer labs
- \* computer-based (offline) training
- \* practice tests
- \* authorized training centers
- \* non-authorized training centers
- \* college classrooms
- \* boot camps
- \* product documentation

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\* vendor-sponsored seminars

Many people use multiple study methods while preparing for exams. Which combination works best depends on individual learning styles, budget, and availability. While the most popular certification programs are surrounded by learning opportunities, less popular but still valuable certifications will come with a more limited selection.

## Self Study

Many certification candidates choose to prepare for exams through self-study. This works especially well if the certification training uses hardware or software that you already have, or can obtain inexpensively or for free. For example, individuals seeking a Java certification can download the current Java platform from [Sun's Web site](#) for free. But even if the hardware or software isn't freely available, self-study can still work. For example, if one of Cisco's router certifications is on your list, purchasing the equipment and setting up a home router network would be prohibitively expensive, but access to someone else's router setup over the Internet is an affordable option.

## THE BEST BOOKS

Books are a favorite self-study tool. Through Web sites such as [CertificationBooks.com](#) and Amazon.com, it's possible to obtain books written specifically for a particular certification's objectives. Some of these books will be "official" study guides. But many are written by independent authors and are also quite good.

When choosing a self-study book, it's important to learn as



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much as you can about the book before you buy it. Unfortunately, some titles are churned out as quickly as possible in an effort to be first to market, and may contain numerous errors or may not have had a thorough technical review prior to going to the printer.

One of the best ways to select a good certification book is via word-of-mouth. If you know someone who's earned the same certification, ask them which titles were best. You can also visit online computer-related forums and post your questions there. In many cases online bookstores include reader reviews of each title. Look for a title with numerous positive reviews, but don't discount a book because of one or two negative reviews. Sometimes reviewers have an ulterior motive, or are blaming their failure to pass an exam that they really didn't study properly for on the book. But if you see several reviews reporting that the book contains technical errors, look elsewhere.

It's also fairly safe to choose a certification book based on the author. For a new certification program, any related books will be new too. That means reviews will be hard to come by. If that's the case, look for other titles by the same author and check out the reviews associated with those. This can be a fairly reliable method when other options aren't available.

## ONLINE COURSES

If marching through a book full of highly technical information is more than you can bear, consider taking one or more online courses. The format is more interactive, and often you will be able to interact with other students and even instructors via email or discussion boards. An online

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course is likely to be organized into units, just as a book is organized into chapters. But the course is more likely to include assignments that will reinforce your knowledge, and often, direct access to subject matter experts who can clarify sticking points.

In the case of vendor-specific certifications, online courses are often available directly from the certification vendor. Check the vendor's Web site for educational offerings. You can find additional Internet-based courses through search engines. Just search Google for "online computer training."

## OFFLINE COMPUTER-BASED COURSES

While online courses offer increased incentive to move forward and interaction with other students, offline courses offer portability. You can work on them any time, anywhere, at your own pace. Usually they come on a CD or DVD disk. Be sure to try a demo first – some courses are little more than talking heads, while others offer an interface that will draw you in and make even arcane subject matter interesting. A quality source (with free demos available) is [CBT Nuggets](#).

## VIRTUAL LABS

Some certification programs focus on particular hardware. Cisco certifications are a prime example. When someone wants to achieve a Cisco certification, they really need hands on access to Cisco routers to practice on. But routers are expensive, and though some students set up a home lab with second-hand equipment, others must attend a classroom course to get the access they need. That is, they

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used to have to do that. Now, there are virtual labs.

With a virtual lab, students can log on to a remote system through any computer that can access the Internet. A student training for Cisco certification can practice on real routers, without having to own them. This is extremely useful and quite cost saving. For current virtual lab offerings, once again, search engines are the place to go. For Cisco router labs, for example, search for “virtual lab router.”

It’s also possible to use software that simulates the hardware. A good example is Boson’s [RouterSim](#).

## PRACTICE TESTS

One of the most popular exam preparation tools is the practice exam. Practice exams mimic the actual testing environment and offer questions in the style and format you will find on the real exam. They are a good way to test your exam readiness and identify areas of strength or weakness. Most practice tests include explanations of why an answer is correct or wrong, a great learning tool. You can find many practice tests covering most certifications at [GoExam.com](#).

## BRAIN DUMPS

As you prepare for certification exams, you are almost certain to come across something called a brain dump. Brain dumps are alleged to be actual exam questions and answers, “dumped” from memory right after taking a test. Sometimes they are free, other times a fee is charged. Stay

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away from them.

Brain dumps are dangerous to your career. Creation and use of them violates the ethical tenets of virtually every certification program. If it's discovered you used them, it's possible your certification could be revoked. Also, they are often wrong. If you rely on memorizing erroneous information, you will fail the test.

Most importantly, the goal of certification is to enhance your expertise and advance your career. Brain dumps do a disservice to yourself and your employer. If you cheat by using brain dumps, where will you be when faced with a technical problem that someone with your certification should know how to resolve? If you achieved certification through cheating, you will not be in a very good career position. So, bottom line, it's clearly best to avoid the temptation of brain dumps or anything like them.

## Classroom Training

If you need hands on access to hardware or software you don't have, want to learn a lot in a little time, or simply prefer traditional instructor-led learning, classroom training may be just what you need.

With classroom-based learning, a schedule is preset for you, which can be a very valuable feature. You also receive direct access to the instructor, and have a community of students to interact with. But these plusses come with a higher price tag than other forms of training. Still, it may well be worth it, especially if your employer is chipping in for the cost or if you are in a hurry to get certified. You can find an extensive directory of computer training schools on

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GoCertify.com's [training page](#). These schools are happy to provide free information to anyone who requests it.

### TRAINING COMPANIES

The first stop for many certification candidates is a professional training center. Training centers offer courses that are tailored to the working professional. Many of their courses will be directly linked to a certification, creating a direct path to taking and passing a particular exam.

Certification training companies come in two varieties: authorized, and not authorized. The authorized programs are directly endorsed by a certification vendor. In exchange for this endorsement, the center has typically agreed to terms specifying the format of the course, as well as what training materials can be used. Authorized training programs offer some reassurance of quality.

However, training centers that do not carry the official seal of approval can be just as good, or at times even better. Because they are not constrained by a predefined curriculum or prescribed learning materials, they are free to tailor their courses to exactly what they feel is necessary for certification. Often these types of programs are run by professionals who have earned the certification in question, and are quite expert on how to obtain it.

Training centers of both types can be found through your local Yellow Pages or via the Internet. If you know anyone who has taken such training, ask their opinion of the training vendor, and you may find out all you need to know to make an informed decision.

### COLLEGE COURSES

A big plus for college courses as a certification training alternative is cost. Often they will be substantially cheaper than a similar course at a training center. Because they follow the school calendar, they also offer learning at a more leisurely pace, which can aid subject matter retention. College courses are more likely to adhere to the officially authorized curriculum and materials; however they are often only available for the most popular certification programs. Check your local community college for availability. You can also find them through the directory on GoCertify.com's [training page](#).

### BOOT CAMPS

If you want to achieve certification as quickly as possible, a boot camp may be the way to go. Boot camps offer intense, highly condensed training. A typical boot camp program will last 3-5 days, from 8 am to 5 pm. This immersion works well if you can drop everything and focus on your training. It's likely additional study time will be needed before you're ready to take the exam(s), but a properly-run boot camp will put you well down the road toward certification.

Because of the format – intense immersion - boot camps can be one of the more expensive alternatives. It's likely you'll need to stay in a hotel and possibly travel to a distant site for the training. The best way to find a certification boot camp is through the Internet. Be sure to ask for references and check them before signing on the dotted line.

### ADDITIONAL RESOURCES

Product seminars and product documentation can serve as supplementary learning materials. So can a well organized study group. Internet-based study groups allow individuals in diverse locations to share the learning process as they pursue certification.

If there is someone at your place of employment that already holds the certification you seek, ask them which study methods they used and recommend. Use what you learn to combine learning alternatives in the way that best suits your personal learning style and budget, and soon you will be certified.

# Chapter 4

## Plan Your Budget

Depending upon the program and training methods you choose, obtaining a professional certification can entail a substantial investment. Because there are numerous routes to a single certification, it can be difficult to make an accurate assessment of what your actual cost will be. However, it's worthwhile to work up an estimate in advance so you won't be blindsided by unexpected expenses.

A detailed expense estimate can also help convince your employer to pay for part or all of your certification costs. When you itemize the figures on paper, you demonstrate that this is not just a whim; you have carefully considered the path to your goal, its costs, and its consequences.

Once you've developed your estimate, you'll also be able to create alternate scenarios. This will enable you to compare the costs of various approaches. With that information, you'll be able to decide, for example, whether the classroom training classes are worth **X** dollars more to you than the self-guided CBT course covering the same material. You'll also be able to identify potential savings points, which can prove very useful if your funds are in short supply.

Throughout the process of estimating your expenditure, it's



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important to remember that while you may be laying out a substantial chunk of change today, you're doing so in expectation of an even larger payback in the future. That payback comes in the form of increased income, a better job, and increased personal and professional satisfaction.

## Total Expenditure

Standard certification expenses include study materials, training costs, testing fees, and application fees. Depending upon the program, you may also find yourself paying for travel to a training site or lab test, purchasing equipment or software, or incurring other charges.

Another expense you'll encounter is opportunity cost. Opportunity cost addresses the value of what, besides money, you'll be giving up in order to pursue certification. If you'll be studying during your usual work hours, then you won't be producing the income you otherwise would. If that will be the case, then your opportunity cost is measurable in dollars.

Some might argue that another opportunity cost is time out from other career advancement or networking activities. But focusing on certification is really a shift in method rather than a replacement for such activities; the time is still being dedicated to the same purpose but in a different way. In fact, you'll most likely be spending more time (or at least more effective time) on career enhancement activities than you would otherwise.

If you plan to do the majority of your studying outside your usual business hours, then you won't be trading income for study time, but you'll still be taking time from somewhere else, such as family time or other areas of personal life, and

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dedicating it to your professional goals. That's an opportunity cost that's more difficult to quantify but still important to keep in mind.

Table 4.1 lists both the monetary and opportunity costs of certification.

Table 4.1 certification costs.

Out-of-Pocket Expenses	Opportunity Costs
Training tuition	Forgone earnings
Study materials	Reduced personal/family time
Test/lab fees	
Application fee	
Travel to testing/training facilities	

## CREATING A WORKSHEET

In estimating your total expenditure, it's helpful to use a worksheet. You can make it the old-fashioned way--with paper and pencil--but a spreadsheet generated using Excel, Quattro Pro, or other programs will be quicker and more versatile. A sample worksheet is displayed below:

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The screenshot shows a Microsoft Excel spreadsheet with the following structure:

1	A	B	C	D	E	F	G	H
1	<b>Certification Name</b>							
2								
3	<b>Your Hourly Rate</b> (enter 0 to exclude opportunity cost)	<input type="text"/>						
4								
5								
6	<b>Individual Requirement Costs</b>							
7	Requirement Description	Tuition for Related Training	Cost of Study Materials	Test Fees	Related Travel/Lodging Costs	Work Hours Spent on Req. (opportunity cost)	Opportunity Cost	<b>Total for Req.</b>
8						0.0	\$0.00	\$ -
9							\$ -	\$ -
10							\$ -	\$ -
11							\$ -	\$ -
12							\$ -	\$ -
13							\$ -	\$ -
14								
15	<b>Estimated Total Expenditure</b>	<input type="text" value="\$ -"/>						
16								
17								
18								
19								
20								
21								

To calculate your total expenditure first enter the certification name at the top of the sheet. If you prepare multiple worksheets (to compare various certifications), the name will make it easy to identify which worksheet goes to which certification program.

Next, enter your hourly pay rate. Your hourly rate is needed to calculate your opportunity cost. If you don't wish to include opportunity cost in your estimate, simply enter 0 (zero) for hourly rate.

The next section contains the meat of the worksheet. Beginning with the first requirement needed to obtain the

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certification, enter a brief description of the requirement. Then go across the row, filling in estimated tuition, cost of study materials you'll need to meet the requirement, any test fee related to the requirement, associated travel costs if you'll need to attend training elsewhere, and, last, the number of hours you'll take from work and apply to meeting this requirement.

To determine the opportunity cost, multiply your hourly rate by the number in the "Work Hours Spent On Req." column. The total cost of the requirement is calculated by summing all numbers in the requirement row *except* the entry in the "Work Hours Spent On Req." column.

For each requirement you need to meet, fill in another row. Don't be afraid to make an educated guess at figures you don't know. You can dig up the actual numbers by calling vendors, surfing the Internet for course listings, or asking friends.

The last step is to add in the application fee, if there is one, and any other fees or expenses you've identified. Add the total requirement expenses and the total miscellaneous expenses to obtain your total certification expenditure.

Save the completed worksheet, or print it out. Then you can go back and play with the numbers to create "what if" scenarios. If you complete the necessary training through CBT self study instead of instructor-led training, how will the total expenditure be affected? If you work on certification strictly outside your regular business hours, how much will you save in opportunity cost? To go back to your beginning worksheet, you can simply reload the version you originally saved. Additional scenarios you want to keep should be stored under other file names or

printed out.

## How To Cut Your Costs

You can significantly cut your certification expenditures in a number of ways. Most of them will come with one or more trade-offs that you'll have to measure against your savings. As we all know, cheaper isn't always better and sometimes may not even be adequate. Which cuts make sense in a particular situation is a highly personal decision that involves factors such as your available free time, your individual learning strengths and weaknesses, your financial situation, the extent of your employer's support, time pressures, and so on. With that in mind, the basic ways you can make certification more affordable are:

- \* Convince an employer to shoulder part or all of the cost.
- \* Cut your training costs.
- \* Spread out your expenses over time.
- \* Take any related tax deductions you qualify for.

## GETTING SUBSIDIZED

There are several routes you can try in order get your employer to fund part or all of your certification training.

### Tapping the Company Budget

At least two areas of the company budget are potential contributors of certification funding, especially at larger organizations: the departmental training budget and the company-wide tuition reimbursement program. Your

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employer's department training budget is likely to cover a broader variety of training options than the tuition reimbursement plan. Still, it may have been created largely with manager-selected and in-house training in mind, so you'll have to approach your manager (or the appropriate human resources person) and convince him or her that certification training and/or testing is an appropriate use of the funds. Be prepared to explain how your certification training would provide value to the company and why the company should fund it. Think of this as a business presentation, and prepare for it by collecting the necessary facts and practicing beforehand in private.

A tuition reimbursement plan is typically more narrowly defined than a training budget; it's often limited to courses that qualify toward a traditional degree. But that doesn't mean it can't fund certification training. If you are working toward a degree of some kind, many certification courses and programs are accepted by colleges as transfer credits and applied toward your degree. If you can demonstrate to your company that the programs will count toward your degree and the company has a tuition reimbursement policy, there's a good chance you'll be able to get certification training coverage.

If you hope to receive funding from your employer, it's important to investigate both the tuition reimbursement and training budget possibilities *before* you begin your program. There may be steps you'll have to take to qualify for the funds, and you'll want to find out just how much of which kinds of training will be covered.

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## Questions To Ask The Budget

### Minders

At a large corporation, there's usually a human resources department, and within it, an individual who is in charge of employee benefits. That person is the one to bring your questions to. In smaller companies, start with your manager or supervisor. If she can't answer your reimbursement questions, she'll be able to direct you to someone who can. Here are the important questions to ask:

\* If you take certification courses that are recommended for college credit, will the company cover the tuition?

\* If the certification and/or training will benefit your job, will the company cover your costs?

\* Besides tuition itself, will the company reimburse you for related expenses such as books and travel? If so, which expenses are covered?

\* What evidence will you need to provide in order to obtain reimbursement?

\* Are there limits on the total reimbursement you can receive?

In addition to the above questions, take care to clarify any reimbursement-related concerns you have. It's a good idea to present your queries in the form of a memo, and to request the answers in writing, signed by the person

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who provided them. Then, if a difference of opinion arises later over just what was promised, you'll have indisputable evidence to support your side.



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### The Payback Plan

When you can't obtain funding as part of an existing budget category, consider working out an arrangement with your employer. One reason that employers may be reluctant to finance certification is the fear that the newly qualified employee will jump ship. You can understand how, from the employer's perspective, spending money on an employee to enable that person to leave (taking their expensive training with them) for another job would be counterproductive. So you may have to offer some reassurance.

One of the more common methods of overcoming this impediment is to form an agreement with your employer that insures the company against your departure. Basically, you agree in writing that if you leave the company within a certain period of time after receiving company-financed certification training, you will reimburse the company for its expense. If you decide to move on after the end of the specified period, you won't owe the company anything.

An arrangement like this often allows for prorating the amount of refund you would owe the company, based on how long you remain with your employer after training. Recruiting companies may also agree to an arrangement like this in return for your promise to continue to use them as your placement agency.

Look ahead. If you're very dissatisfied with your current position (or recruiting company) and expect to leave in the near future, this probably isn't a good way to pay for certification.

### TRAINING ON THE CHEAP

One of the most effective ways to cut your certification expenditure is also perhaps one of the simplest: Be budget conscious when selecting and purchasing training for your certification. Because of the popularity of certification, there are many vendors and an extensive array of training options to choose from. A few rules of thumb to keep in mind are:

- \* Self-study is less expensive than instructor-led training.
- \* A training package is often cheaper than purchasing the components separately.
- \* Special discounts are frequently available, if you ask for them.
- \* Training time span affects costs.
- \* Prices vary significantly among training vendors.

#### Training Methods And Costs

Self-study is radically cheaper than instructor-led training. Although a typical three-day Learning Tree International course comes with a standard tuition of \$1,995, including related exams, you can purchase a self-study kit covering similar material for less than half that. Depending on your learning style, abilities, existing knowledge, and access to other resources, you may be able to get by with a study guide or even just studying the manuals that accompany hardware and software related to your topic.

You'll also find "study kits" and CBT software on the market. The kits incorporate several training media, such as videotaped presentations, text material, and self tests, into one package. Each package is dedicated to a specific

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certification designation or requirement. The price and quality of these products vary widely, so don't commit to any of them without a solid preview.

Professionals who've taken the self-study track often recommend study materials that include practice tests, so that may be an important feature to look for. You'll also find that some companies actually guarantee that if you use their materials (or take their classes) that you will pass the associated test, but don't be misled; the best guarantee in the world isn't as meaningful as your personal determination--you're in this to get certified, not to get your money back.

If you don't feel confident that self-study will work for you, the next level up is facilitated training online. Courses offered via the Internet are cheaper than their classroom cousins and offer some of the same benefits. You'll have access to an instructor and interaction with other students, but you won't have to travel to a training center or follow as rigid a schedule.

Step up to another price level and you'll encounter another option that may prove just the ticket if time isn't in short supply: college classes. Increasingly, the same exact certification classes offered by authorized training companies are available as college courses. The major difference is the time span; instead of blasting through requirements with several intense, sequential days of training, you'll complete them at a more leisurely pace. For some people, the pace is a bit too leisurely. The selection of supported certifications is also quite limited, with courses for Microsoft, Novell, and the A+ certifications being the most widely available. But when instructor-led training appears to be what you need, colleges will save you money

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over commercial training centers.

The top tier of certification preparation, in cost, is the authorized training center class. For some people and for some requirements, it can be irreplaceable. You'll have the equipment, trained and certified instructors, and other resources at hand. But you will pay for it. This type of class may be the way to go for requirements you find especially daunting, but in other cases, lower cost options will do the job handily. Table 3.2 illustrates the comparative costs of the various options. The table provides a general expense assessment based upon typical market prices, but individual products may sometimes fall outside their category.

Table 4.2 Comparing training costs.

Method	Standard Price Level
Self-study book/manual	\$
Single CBT program	\$\$
Online class	\$\$\$
Self-study kit	\$\$\$
College course	\$\$\$\$
Unauthorized training vendor	\$\$\$\$\$
Authorized training vendor	\$\$\$\$\$

### Package Deals

Just as stocking up in a supermarket can pay off, bulk purchasing training can, too. If you're preparing for one of the more complex certifications, there will be multiple requirements and corresponding exams. Training vendors want to keep your business, and one way to do that is to hook you in for an extended period. In exchange for customer loyalty, they offer substantial savings.

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### Special Discounts

Make sure you ask about any available discounts. You may find that government employees or other specific groups that you may belong to are eligible for reduced rates at a particular vendor.

### Shop Around For The Best Deals

In contrast to purchasing the entire shebang from a single vendor, you can also purchase a piece here and a course there. This method requires a greater investment of your time and legwork (or keyboardwork), but will allow you to purchase each training item at the lowest price you can uncover.

To locate training vendors in your area, you can contact the sponsor of the certification you're pursuing. But that's only a starting point because the listing is likely to be limited to authorized trainers. Internet search engines are a powerful tool for uncovering training vendors.

Part of effective price shopping is to ask others who've pursued the same credentials where they obtained training and materials, how much they paid, and how they rate the vendor they purchased from. In this way, you can gather tips that will spare you both search time and quality problems.

### Make Your Funds Do Double Duty

If you can't trim your training costs appreciably, perhaps you may be able to get double mileage for your money. A certification training course may qualify for college credits toward a degree program, so be sure to check with your academic institution beforehand to see if and how you can get your training applied toward your degree.

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### Condense Training

Getting back to opportunity cost, one of the simplest ways to cut your expenses is to reduce the amount of time you spend earning certification. When work time is being devoted to certification, it isn't being used to generate income. That's the age-old time-equals-money equation.

Correspondingly, less time equals less money. That is, reducing the amount of time away from work can drastically reduce total certification costs. For example, if your income works out to an hourly rate of \$35 per hour, and you cut 20 hours off your certification training time, you've trimmed \$700 from your certification bill (or conversely, returned that 20 hours to the income side of your budget resulting in an additional \$700 to your bank account).

Another way to compress certification time is to take intense, condensed courses or sequences of courses. Because the vendor doesn't have to repeatedly set up the training environment, coordinate staff and facilities, or lay out other one-time costs, the vendor's cost is lower than offering the same material over a more extended period of time. The savings are often passed on to the student.

### Stretch It Out

If financing certification will just put too much of a squeeze on your budget, you may be able to manage it more easily by meeting the requirements over time. Your overall cost may well be higher than if you didn't follow this route, but it will be spread out into more manageable outlays. You may even find that once your certification is underway, you'll be able to boost your billing rate, and financing your education will no longer be a problem.

### Taking Advantage Of Tax Breaks

Although taxes may be an inevitable price of life in the United States, that doesn't mean you have to pay more than your fair share. Luckily for people pursuing professional training, Uncle Sam smiles on citizens who work to improve themselves and their economic position. A strong worker makes for a strong economy, and all that. So employees who pay out-of-pocket for certain types of education get to deduct their expenses from their federal tax return. The available deductions apply whether you're self-employed or on the payroll of a national conglomerate. If you're not self-employed, you'll need to itemize your deductions in order to claim these, too, and the amount will be subject to limitations.

Because of the ever-shifting nature of the tax landscape, it's a good idea to consult a tax professional or study up, using publications from the IRS for the latest details and tax laws.

There are many other educational financial aid options open to you. Visit your local library for help uncovering them. Or go to the [Financial Aid Information page](#) on the Internet.

## Chapter 5

### How to Study Effectively

Is it possible to graduate from high school, college, or even graduate school without mastering effective study skills? In a word, yes. Learning how to learn rarely receives the attention it should in our system of education. It sometimes seems to be assumed that it's something everyone knows instinctively, like putting your hands out to catch yourself when you stumble.

But in fact, extending your arms to cushion a fall isn't instinctual, it just feels that way because you've been doing it for so long that it's become second nature. If you observe young children who've just begun to walk, you'll notice that they stumble a lot. And when they stumble, they fall, usually face first. It's only after repeatedly banging their forehead or nose that they begin to catch themselves with their hands.

At first glance, studying might also seem like an inherent skill that you either have or you don't. But like putting your hands out when you trip, it's a learned behavior. And, similarly, once you've mastered effective techniques, you'll be able to apply them again and again throughout your life. At first it will require deliberate effort, but with time and practice, it, too, can become second nature.

You already know how to study, you say? If you're really



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fortunate, then you do. More likely, you know just enough to get by. When study skills are lacking, an increase in effort can sometimes compensate for lack of ability. But studying doesn't have to be a mind-numbing feat of endurance, and exams don't have to tie your stomach in knots. Nor should you feel embarrassed if your study skills are weak; it's not that difficult to fix them. Once you do, you'll find the act of learning can become downright pleasurable.

As an adult learner, your educational circumstances are significantly different than they were when you were in high school or college. It's likely that you have more demands competing for your time, including a full-time job and possibly a family. But you have an advantage over many of your counterparts in a very important way-- motivation. You're studying because you've identified a goal you want to obtain (certification). You have a concrete vision of how achieving your goal will benefit you. You're placing at least some of your own money on the line. Getting down to business will be easier this time around.

Learning to study effectively means gaining control and understanding in three main areas: environment, methods, and motivation. The skills you already have in these areas can be strengthened and augmented with new techniques. First, let's look at a few myths about studying.

## You Might Have Heard That

Smart people don't have to study.

This is one of the most widely held misconceptions about studying. Everyone knows an individual who appears to glide through academics with little effort. They always get

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excellent scores on exams yet never seem to crack a book. How can this be?

It simply isn't true. Some people do need less study time than others, but that often can be linked to efficient and effective techniques rather than to a high I.Q. score.

Consider reading speed. One student may read at a rate of 250 words a minute and will take about six hours to read a 90,000-word book. A faster reader, cruising along at 500 words per minute, will finish that same book in only three hours. Is the slower reader not as smart? Not necessarily. He's just not as skilled a reader.

The other contributing factor to the myth that smart people don't have to study has to do with where they study. Rather than trying to concentrate in the midst of a crowded cafeteria, for example, they hit the books in a private (and quieter) environment. Only those that live with them see them studying. And if word starts to circulate that they're so smart that they don't have to study, why deny it?

Cramming is a good way to remember things.

No. Cramming is the way to forget things! Think back to a time when you applied this technique yourself, probably out of desperation over an exam looming the next day. You may have achieved a decent score on that test, but what do you remember of the material now? Or even just a week after the test? If you're like most people, the facts quickly evaporated from your mind.

The human brain strengthens the connections between bits of information through repetition. Although cramming may stuff enough facts into short-term memory to pass an exam, short-term memory is just that, here today and gone tomorrow. Storing information in long-term memory

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requires repetition and sustained effort. Certainly, last-minute studying does have its place: as a review tool. But its true effectiveness is as a supplement to a more sustained kind of learning that will place information at your service today, next week, and next year.

The more you study, the more you learn.

Longer study periods covering greater quantities of material may, in fact, be detrimental to your ability to recall the information. Your attention span isn't unlimited.

Everyone reaches a saturation point where information seems to flow into one brain cell and then proceed directly out of another. It's as if your brain is saying "give me a break!" In fact, that may be just what is happening. Recent research suggests that the human brain requires time for new information or skills to become "hard wired," and that introducing a second skill or batch of information right on the heels of the first interferes with that process.

Essentially, the brain needs time to process what it has just received.

Think about learning two phone numbers. If you work on both simultaneously, you'll probably exchange digits between them and take more time to be able to correctly recall either one. However, if you take them one at a time, and get the first down cold before taking on the next, such confusion is unlikely to occur. More studying is not automatically better.

Background noise can help you concentrate.

Studying with the television running may feel like less work, but it's also working less. When part of your mind is occupied filtering and interpreting background noise, it's not available to focus on the information you're studying.

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Background music also interferes with your ability to concentrate, although music without lyrics is significantly less distracting than music with them. For best results, focus your full attention on your task. You'll finish sooner and can then fully enjoy your music or television show.

Studying requires substantial, uninterrupted blocks of time.

Ideally, you should have at least some interrupted periods. But not having them doesn't preclude study opportunities. Squeezing "study snacks" into the margins of your daily life can be very beneficial. Consider the times you find yourself waiting: for the bus, for an elevator, for the next available bank teller, or for a take-out lunch. If you carry notes, in some form, in your pocket, you can whip them out at these times and grab a few minutes of power studying. Over the course of a week, these "study snacks" can add up to a significant meal of information.

## When To Study

You don't have to be a time management expert to recognize that most people cram an incredible array of activities into the course of a week. If you're one of them, you may be wondering how you're going to squeeze study time into an already crowded schedule. Although small amounts of study time can prove quite valuable, longer, uninterrupted blocks are necessary. Finding them can be a challenge. Fortunately, it's one that you can conquer.

Every week contains 168 hours. That's more than 10,000 minutes. A basic eight to five job, with no overtime and a half hour commute each way, cuts fifty hours off the top. Allocate another forty-five minutes to shower, dress, and

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eat breakfast before leaving the house, and that's another three and three-quarters hours gone. What about sleep? At eight hours a night you're snoozing away 56 hours each week. Take another half hour a day to microwave and eat dinner and the total reaches 113 hours. That's 6,795 of your precious allotment of minutes expended on basic living, without even getting to sleep in on Saturday morning.

That's the bad news. The good news is that the above bare-bones regimen still leaves another fifty-five hours or so (specifically, 3,285 minutes) in your time bank. It's up to you to spend it wisely.

Granted, much, if not all, of that time is already spoken for. Some of it's devoted to activities you won't want to give up. But if you examine your use of time closely, chances are you'll be able to massage your schedule and slide study time into your life fairly painlessly.

If the time slots open to studying aren't obvious, a time usage chart will reveal them. To make one, mark fifteen minute time increments along the left side of a piece of paper. Create seven columns across the top, one for each day of the week. During the next week, record what you do throughout the day by listing the activity and blocking off the amount of time used. At the end of the week, add the total amount of time you spent on each activity. Analyze your chart to determine:

- \* Which activities do you spend the most time on? Is the amount of time you devote to them reasonable? If not, think about how you can cut back.
- \* Which are the biggest time wasters? Does your time chart show hours of television watching, excessive phone calls, or frequent nights out? Looking for

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misplaced items is a frequent time waster that probably won't even make it onto your chart.

- \* What can you cut back or eliminate to make room for studying? The time wasters are prime candidates for the axe. You can let the answering machine take phone calls, become more organized so you don't spend as much time finding things, and/or turn off your television. You also might identify commitments, such as volunteer work or league sports, that you can reduce while you're working toward certification.

This isn't to say that you should completely cut out your social life and leisure activities. In fact, those are things you should be careful to include in your schedule. To succeed as a learner, you also need time away from the books so you can relax and maintain your health.

When choosing study times, keep the following principles in mind:

- \* Schedule study time during those times of day that you feel best. If you're a morning person, consider getting up early so you can get in a half hour before work. Are you a night person? Then skip the evening news and work on your certification program instead. You'll absorb material quickly and more easily when you are fully alert.
- \* Learn to say no. During this time, try to avoid taking on extra work. Some people find it hard to refuse any request, especially those that come from coworkers or charities. But a simple reply like: "I'd love to be able to do that for you, but right now my schedule is booked solid. Maybe another time?" will protect your study time without hurting feelings. If you're someone who

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finds it difficult to say no, practice in front a mirror until the words just flow from your lips.

- \* Build a cushion into your time estimates. Avoid the temptation to schedule things to the minute. Inevitably, something unexpected will occur. If you haven't allowed time for it, you'll end up chasing your schedule for days afterward.
- \* Study the worst first. If you are dreading a particular study unit or practice material, take it on first. Chances are you'll discover it isn't nearly as onerous as you expected, and with the hardest part out of the way the remaining materials will be a cake walk.

## Where to Study

Where you choose to study affects how successful you will be at learning and remembering the information you cover. While it's possible to study on the subway, a park bench, or at the kitchen table, your best study space is likely to be elsewhere. What makes a study area ideal? The perfect study environment is one where you can work in distraction-free comfort. It's physically and psychologically conducive to the work at hand, without being so comfortable that it puts you to sleep.

Selecting a regular study place has another advantage: mental conditioning. Think of Pavlov's famous dogs. Each time the animals were to be fed, Pavlov rang a bell. Soon, the dogs began to salivate at the sound of the bell alone. They developed a physical response to the expectation of food. They were conditioned to respond to the bell.

Similarly, you can condition yourself to study. If you use

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the same study spot again and again, you will begin to associate it with studying. Over time, your mind and body will become conditioned to learn whenever you enter your study area. Sitting down and getting to work will become more automatic.

Your chosen space should have adequate lighting: bright, but not glaring. It should provide a chair and desk or table. The chair should be a standard desk chair, or one you might find in a conference room or classroom. Don't study in a cushy arm chair. You'll end up slouching and holding your study materials at an awkward angle, both of which can interfere with your ability to concentrate and cause muscle soreness. If you're laying back in a soft chair, especially in a warm room, you may doze off.

The work surface can be a desk or table. Whichever it is, there should be plenty of space to spread out your study materials. It should be at a comfortable height so you can study for extended periods without strain. The surrounding environment should be quiet and free from distractions and interruptions. That means the television and radio should be off, and, if you're at home, let the answering machine answer the phone. Don't park yourself in front of a picture window either; a blank wall will be less distracting. Instruct family members and coworkers not to interrupt you. Have all your study materials—calculator, notebook, extra pens, and so on—at hand so you won't have to get up to fetch something.

Schedule regular study times. It will help you get into the habit of studying and will aid the conditioning process mentioned above. Choose a time of day when you usually feel alert. Consider eating a high-protein snack beforehand so you don't get hungry.



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Study sessions don't have to be marathon events. If you need a break, take one. Get up, stretch, and wander down the hall for a few minutes. Try to limit breaks to ten minutes or less. Four one-hour study sessions will prove more beneficial than one four-hour session.

Common study locations include a library, an empty conference room, or a kitchen table. Lack of the perfect study area shouldn't keep you from the task at hand. Though a comfortable, well-lit, and distraction-free environment is best, reality may dictate other circumstances. Do your best to schedule study periods following these ideal conditions, but when it comes down to it, if life interferes, study where and when you can.

## How to Study

Once you've nailed down the when and where of your study plan, it's time to focus on study techniques. By making effective use of your study time, you can cut down the amount of time needed while simultaneously increasing your comprehension, recall, test scores, and self-confidence.

Study skills are best organized by task. Thanks to the perennial fountain of students and teachers, methods have been developed for getting the most out of a textbook, taking effective notes, tricks to improve your memory, test preparation, and more. Although there are also tips and tricks for writing papers, you're not likely to need to do that in the course of certification training, so it isn't covered in this book.

The key to all of these methods is your involvement. To be an effective learner, you need to be an active learner. The

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information that comes your way via self-study and classroom activities won't stick with you just because it passes by your eyes or ears. But if you operate with the intention of making it stick by using methods that have been proven to work, you will learn and remember.

### HOW TO READ A TEXTBOOK

One of the most effective and most widely taught textbook study methods has been around since the 1940s, when it was first developed by Dr. Francis Robinson. It's called SQ3R. The acronym is derived from the five steps of the system: Survey, Question, Read, Recite, and Review. Following them will greatly increase your comprehension and recall of textbook material. They can be applied to an entire book, to a single chapter, or to any reading assignment. Let's go over the steps in order.

#### Survey

The first step is to survey the reading material. Just like a construction surveyor determines the lay of the land, your goal is to determine the overall shape of the book. Read the title, preface, introduction, and table of contents. Then flip through the rest of the book (or chapter), reading only the boldface headings and subheadings. Scan any illustrations to see what they are about. Surveying an entire book should take less than a half hour. When you're finished, you'll have a good feel for what the book is about and how it's organized.

#### Question

The next step, signified by the Q in SQ3R, is to question. This very important step transforms you from a passive

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reader to an active one. Instead of expecting the book to feed you information, you'll be able to work to extract it by focusing on learning the answers to questions you develop in advance. To develop your questions, scan back through the reading material, again focusing on the headings and subheadings. This time, rephrase them as questions. Table 4.1 shows headings from a book chapter about Linux, along with questions that could be derived from them.

Table 5.1 Headings and questions from a Linux text.

Section Heading	Question
How to Manage Your Files for managing files?	What methods are available for managing files?
How to Manage Your Users and configured?	How are users added, deleted, and configured?
How to Manage Your Software with lisa	What is lisa and how does it work?
How to Manage Your Services and how to I manage them?	What services are available and how to I manage them?

### Read

The third step (the first R) is to read each section keeping the questions you formulated in the previous step in mind. Pay especially close attention to the first and last sentences of each paragraph. The first sentence, called the *topic sentence*, will reveal the main idea of the paragraph. The last sentence typically brings discussion of that particular idea to a conclusion.

### Recite

The second of the three Rs in SQ3R stands for recite. After you read each section, *without consulting your notes or the*

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*text*, do your best to recite the questions you developed and their answers. You can do this silently or out loud. Out loud is better because it applies an additional sense, your hearing, to enhance your learning. If you can't answer the questions from memory, look back through the text and try again. When you can answer the questions from memory, go on to the next section.

### Review

The final R stands for review. This is where you begin seriously building your memory of the information. Go back over all the questions you created for all of the sections you read. Try to answer them again. To add kinesthetic (touch/movement) learning, write out the questions and their answers. If you jot them down on index cards, you can then review the information pretty much anywhere, anytime you have a few spare minutes. Repetition will help solidify the information in your mind.

That's all there is to it. Next time you open a textbook remember the acronym SQ3R. Then do it. After you (S)urvey, (Q)uestion, (R)ead, (R)ecite, and (R)evuew, you'll know a lot more than if you had simply read the book.

## HOW TO GET THE MOST FROM A CLASS

Just as you can get more from a textbook by becoming an active reader, you can boost your classroom comprehension by becoming an active listener. To become an active listener in a classroom setting, you'll need to prepare, pay attention, participate, and take notes.

### Before Class

What you do before class dramatically affects how much

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you learn during class. If you prepare properly, the actual class time will be almost a review, reinforcing information you've already learned. You won't be struggling to keep up because you will have developed a good idea of what's coming and familiarized yourself with the concepts and language that are likely to arise.

- \* Preview the material to be covered. Before the first meeting of a new course, obtain a course outline from the professor, along with a set of objectives. Read over it to find out what will be covered. Determine exactly what you will be expected to know when the class is complete. If a textbook accompanies the course, scan through it ahead of time, using the survey method described above.
- \* Prior to each class session, check over the course outline to see what material is due to be covered. If you have a textbook with corresponding chapters, read it using the SQ3R method *before* class.
- \* Arrive early. The first few minutes of class time are often very important. During this time the instructor is likely to introduce the topic at hand and sketch the shape of the material to come. If you're busy opening your notebook and greeting your neighbor, you won't be paying attention and you'll miss out on this important information, and you'll be a step behind for the remainder of the class session. It's much wiser to arrive ten or fifteen minutes beforehand to get yourself organized and mentally in gear.

### During Class

- \* Pay attention. You can't remember what you haven't

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learned in the first place.

- \* Take notes. Research has shown that students who take notes during class remember more than those who don't, *even if they never look at those notes again*. The process of taking notes forces you to pay attention and to organize your thoughts.
- \* Participate in discussions. Again, this forces you to be an active listener. Besides that, you'll also have the opportunity to clarify any points you find confusing. By speaking, you'll also reinforce your learning by verbalizing some of what you've read and heard.

### After Class

- \* Stay late. At least a few minutes late. It can be tough to pay attention when others around you are packing up their books, but those last few minutes of class are as important (if not more) than the first few. Your instructor may use them to summarize what was covered, or, if she has run short on time, may cram fifteen minutes of material into the last five. The end of class is also when you're likely to find out what will be covered next session and what you should do to prepare.
- \* Review your notes immediately after class and fill in any gaps. This will take just five or ten minutes and could save you hours later on. That's because while you'll remember most of the lecture/material for a short time, by the next day, unless you've reinforced it mentally, much of what you heard will slip away.
- \* In conjunction with reviewing your notes (or in lieu of, if time doesn't permit you to sit down with them immediately after class), conduct a mental review of the

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class session. You can do this in the car on your way home or in the cafeteria. Recall what the main points of the session were and why they are important.

### NOTE TAKING 101

Taking good notes isn't a hit-or-miss proposition, it's a learned skill. Effective note taking will help you focus on what is being said, understand it, and recall the material later on. You can gain all of this without requiring a minute more than you'll spend sitting in class anyway.

Although taking notes isn't as simple as pulling out a piece of paper and recording what the instructor says, it's not much more difficult either. To begin, start each class with a fresh piece of paper and record the date and lecture title (if there is one) at the top. Then draw a vertical line about two inches from the left edge of the page, dividing it into two columns. Most of your notes will go into the second, wider column. The first column is for comments, words, and other marks that will enable you to quickly identify key sections of your notes. Little or nothing will go there until you review your notes later.

When class begins, start writing your notes. Don't try to record every word the instructor utters. Instead, aim to capture key points and subtopics, using a structure similar to outlining. Distinguish between major and minor points by indenting or underlining. Write in your own words, not the instructor's. By rephrasing what is said, you'll deepen your understanding of it. The exception to this guideline is if the material is a definition, formula, or rule. In those cases, it's best to record exactly what the instructor says, to ensure accuracy.

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For expediency in note recording and review, use descriptive words and phrases instead of whole sentences. You can save additional time by developing your own shorthand. To do so, substitute symbols and abbreviations for words or parts of words that appear frequently (see sidebar for shorthand suggestions). Add new shortcuts gradually, so you don't find yourself with a page of jumbled shortcuts that you can't decode easily. Remember, your personal shorthand is intended to save you time, not add confusion. Let it develop over time.

Deciding what to include or exclude can be challenging at first, but once you develop your skills and grow familiar with your instructor's style, it will become second nature. Try to capture the main ideas and their subtopics. Listen for key phrases that indicate important information will follow, such as:

- \* "The four principles are"
- \* "Most importantly"
- \* "The most frequent mistake is"
- \* "Always remember"
- \* "In conclusion"
- \* and of course, "will be on the test"

Through voice and body language, the instructor may give cues that key points are imminent. Watch for increased animation or a change in the pitch of the speaker's voice, which should alert you that important points are forthcoming. Pay close attention to anything that is emphasized through use of the chalkboard. If you miss something, leave a blank space in your notes so that you can fill it in later.



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Review your notes as soon as possible after class. This is the time to use that left-hand column. Use it to highlight especially key points and to serve as a quick index to your notes. For example, you might mark ! next to an important point and ? next to something you need to clarify. Identify sections of your notes with key words describing the topic, so that you can locate them easily.

Make sure you record your name and phone number on the inside of the front cover of your notebook. Then, if you accidentally leave it somewhere, you may get it back; otherwise a moment of inattention may cost you all of your notes.

## HOW TO REMEMBER

Do you have a good memory or a bad memory? While the ability to recall information does vary between individuals, it's another study skill (and life skill) that you can significantly improve.

In *Learn To Be A Master Student* authors Robert Rooney and Anthony Lipuma identified three basic functions of memory: labeling information as you learn it, storing it in your brain, and recalling it. You can improve two of these functions. The third, storing, doesn't need enhancement. Your brain already has more storage capacity than you can possibly use in your lifetime, no matter how much information you stuff in there. Don't you wish your computer's hard drive was like that?

The labeling part of the memory process involves deliberately identifying information as you learn it. This can be accomplished through linking new information with other things you already know or by organizing it in a way

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that makes it easier to remember. There are several tricks you can use to improve your labeling skills, including mnemonics and memory mapping. Both will be described shortly.

Your ability to recall information improves with practice. Every time you remember a particular piece of data, your brain becomes better at retrieving it. The brain path to where it's stored becomes more clearly delineated and more deeply entrenched. The process can be compared to finding your way to a new place of employment for the first time versus finding your way there for the twenty-first time. That initial trip requires considerable attention and maybe a wrong turn or two. By the time you've worked there three weeks, you can practically drive there in your sleep (and some mornings it probably feels like you do).

You can also create more than one pathway to a particular piece of information. Doing so enables you to do what you would have to if you encountered a road closure on the way to work--take an alternate route. The more routes you have to work (and the more pathways you create to the information stored in your brain), the less likely it becomes that you'll get stranded without reaching your destination.

### GRASP

The word grasp means to lay hold of with the mind. Here's how to GRASP what you want to learn.

- \* **(G)**et it the first time. If you're not paying attention, you won't learn, and you can't remember what you haven't learned.
- \* **(R)**emember to remember. Learn with the intention of remembering information for a long time (not just until

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the next exam).

- \* **(A)**ssociate new information with something you already know, or arrange it in a pattern that's easy to remember.
- \* **(S)**tudy the same information different ways to create more than one path to retrieving it.
- \* **(P)**ractice remembering. The more you recall a piece of information, the easier it will become.

### Mnemonics

Remember SQ3R? That's right, it stands for Study, Question, Read, Recite, Review. Because you have linked the acronym to the process of reading a textbook, you can more easily remember the individual steps. SQ3R and GRASP are examples of mnemonic devices--memory cues that help you label and recall information. Other mnemonics you've probably encountered include: Every Good Boy Does Fine, which helps you remember the notes (EGBDF) associated with the lines of the treble clef; and ROY G. BIV for the colors of the rainbow (red, orange, yellow, green, blue, indigo, violet). Remember the verse "Thirty days hath September?" That's a mnemonic, too.

Mnemonics are powerful tools that make memorization easier, more interesting, and even fun. They also enable you to remember longer. How many years has it been since you first met good old ROY G. BIV?

You can create your own mnemonics. Acronyms are a form of mnemonics that the computer world is awash in already. Consider WAN (Wide Area Network), RAM (Random Access Memory), IOS (Internetworking Operating System), PROM (Programmable Read Only Memory), and

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ISDN (Integrated Services Digital Network), just to name a few.

To create your own acronyms, consider the items you need to memorize. Can you rearrange them so that the first letters form an acronym you can remember? What if you needed to memorize the stages of the systems development process, in order? They are:

1. Requirements Stage
2. Evaluation Stage
3. Design Stage
4. Implementation Stage

How handy that the first letters form the acronym REDI! Just remember that to develop a new application, you have to get REDI first. In this example, the items needed to be recalled in order. But when they don't, feel free to play with them, rearranging them to see what you can come up with.

Another powerful type of mnemonic is rhyme. Putting information into rhyme format or to the tune of a familiar song creates a fun association that makes it easier to recall.

Another helpful memory trick is to count. For example, if you know that there are seven layers in the OSI network model, you'll know to keep trying if only six come to mind at first.

### The Power Of Pictures

Consider using pictures to help you remember, especially if you are a visual learner. Visualize or actually draw a picture that illustrates a concept you want to remember. You can put yourself in the picture or not. If you can conjure up a humorous scenario, so much the better.

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For example, if you study communication, you'll discover that communication requires: a sender, a receiver, a message, a channel to convey the message, and feedback that informs the sender if or how the message was received. The sender transmits the message over the channel to the receiver. Anything that disrupts the smooth operation of any of the elements is called noise.

How might you turn this information into a memorable image? Here's just one of the infinite possibilities: Picture a husband and wife talking to each other across the living room. The husband is trying to tell the wife that they've been invited to a party. In this example the husband is the sender, the wife is the receiver, the channel is the air in the living room, and the message is the news of the invitation. Now picture a four-year old and a seven year old sprawled on the floor somewhere between couple. Suddenly they begin to squabble loudly over a red crayon. Can you guess which element they represent? The feedback, in this case, might be the wife shaking her head in frustration and pointing at the noisy children.

### Study Groups

Contrary to popular assumption, a study group isn't a place to learn new information; it's a place to practice and reinforce what you've already learned. Depending on other group members to provide you with an introduction to something you haven't studied yet is risky--it may be presented inaccurately, and once you learn something the wrong way, learning it correctly is more difficult. It's wiser to get the facts down first, then use a study group setting to reinforce them.

Study groups are good for increasing your understanding of

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a topic. Since no two people see things exactly the same way, another participant may be crystal clear on a concept that you're struggling with and can guide you through it. You can return the favor for a different concept. You can also compare interpretations. The process of discussing subject matter will clarify material and solidify it in your mind.

Study group members can also drill each other with flash cards or exchange essay questions. This sort of interaction is very valuable when preparing for tests.

You may be able to join an existing study group, but, more likely, you'll have to form your own. Look for two or three individuals working on the same material (or certification) as yourself. You may find them online or through a class you're participating in.

Set regular meeting times--once a week is a common interval--and choose a site conducive to your purpose. A library may not be a good option unless there's a room you can use so your discussions won't disrupt others. An empty classroom or someone's dining room table are also possibilities. Limit meetings to about an hour per session; any longer and the extra time is likely to be spent on socializing rather than studying.

If you're preparing for certification through self-study, your best bet for forming a study group is likely to be via the Internet. Prowl forums and newsgroups devoted to the topic(s) you're interested in, and consider posting a message seeking individuals interested in forming a virtual study group. You can also use the Web search engines to seek out such groups. Use the name of your certification and the phrase "study group" as search keys.

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### Self-Quizzing

One of the simplest ways to practice recalling information is via the self-quiz. Talk about versatility and convenience—you can self-quiz almost anywhere. You can do it with spiffy software, audio tape, or cheap 3 x 5 index cards. You can time yourself, or not. And how often do you get the chance to make up your own questions for a test?

Depending on your choice of certification and how deep your pockets are, you can purchase quizzes that other people have made specifically for your certification.

Many of these prepackaged quizzes are available in software format (see [GoExam.com](http://GoExam.com)). Others come in workbooks.

Besides certification-specific software, there are a number of shareware programs that allow you to create quizzes on any topic of your choice. These can be especially useful if commercial programs are too expensive or unavailable for the material you wish to practice. A favorite is WinFlash, by Open Window ([www.openwindow.com](http://www.openwindow.com)). A free trial version is available on the company's Web site.

If you prefer to go low tech, you can create a set of flash cards using 3 x 5 index cards. Write the question on the front of the card and the correct answer on the back. If you keep a deck of these cards on hand, you can sneak in practice whenever it's convenient to do so. When you think you have one set of cards down cold, put them aside and start another. Come back to the first set later, and see how much you remember.

Books on tape are becoming popular with people on the go. You can create a quiz on tape to listen to during your daily commute or during exercise workouts. To do so, prepare a

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list of questions and answers. Then insert a fresh tape into your tape recorder and press record. Read a question aloud, let the tape roll for a few seconds (however long you want to allow yourself to answer the question you just read), then read the answer aloud. Repeat the procedure for each question on your list. When you play back the quiz later, try to answer the questions before the recorded answer plays. Before you record an entire quiz, run a test batch of a few questions to verify that the tape recorder is set up and operating properly.

## A Half Dozen Ways To Beat Procrastination--Today

Effective study techniques are powerful productivity boosters--if you use them. But if the procrastinator's mantra--"I'll do it tomorrow"--starts playing in your head, it can wreak havoc on your certification plans.

Procrastination often masquerades as some other, ostensibly legitimate, demand for your time. Only on close examination is the disguise pierced. The following are examples of what you can do to keep the procrastination beast on a leash.

## STUDY 15 MINUTES A DAY

For some, unfathomable reason, when it's time to study, the laundry in the corner suddenly becomes more urgent than the new material. So does mowing the lawn. Anything that delays the dreaded moment of sitting down and beginning becomes more attractive than work.

But getting started doesn't have to be so difficult. Simply



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set yourself a daily deadline by which you must sit down and commence 15 minutes of studying. That's right, a mere 15 minutes.

When that deadline arrives, force yourself into your study space and work until the time is up. The method's magic is that once you get going, you won't want to stop! You're virtually guaranteed to continue long beyond 15 minutes and accomplish plenty.

## PUT PROCRASTINATION TO WORK FOR YOU

Make procrastination your slave instead of your master. When you're reluctant to begin a particular project, consider other study tasks you could be doing instead. Is your Personal Certification Plan current? Have you reviewed your vocabulary list lately? Why not go back and draw a memory map for that concept you covered last week? Even if you don't get to the project you really ought to be doing today, other valuable tasks will be completed: there really is nothing like procrastination for getting things done. And once you begin, you just might find yourself picking up the work you're avoiding and completing that as well.

## QUELL HOUSEHOLD DISTRACTIONS

People who study at home know what it's like: the nearby refrigerator seems to call your name. Friends and family telephone to chat just as you settle in to study. You're wearing your last pair of clean underwear and really should run the laundry through.

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While it's certainly the prerogative (and even pleasure) of someone who studies at home to tend to a chore during a break, don't let this can become a should. As in I should do this chore or I ought to do that one because I'm right here and it needs to be done.

During study hours you are not at home--you are at work. If the refrigerator is a problem, weaken its pull by stocking it with lettuce and fruit instead of high fat treats. When callers disrupt your concentration, let the answering machine pick up or simply offer to return calls later. If tasks, such as piled up dishes, beg attention, imagine how you would respond if your study space was uptown at the library instead of upstairs. Would you drive home and suds up or leave them for later? Save your chores and errands for after study time. They won't go anywhere.

## RESPECT WHAT YOU'RE DOING

Frequently, adult learners give their educational efforts a back seat to everything else and consequently get little done. The logic goes something like this: It isn't that important, after all, I do it out of choice, and I already have a job.

The person who lets this thought pattern continue is placing serious limits on his or her success. Your certification goals are meaningful and valuable. You are just fortunate (and clever) enough to be in charge of your own future. Education and professional advancement are something you've decided to go after. Don't let insecurity stop you!

It may help to review your accomplishments. Go over your Personal Certification Plan and review what you've already achieved. Revisit your reasons for pursuing certification in

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the first place. Count your successes and see how you can build on them.

When you interact with others, don't be afraid to talk about your educational accomplishments and struggles or that troublesome exam. To become a confident and successful student, you must act and feel like one.

### GET REGULAR

While a flexible schedule is overtly a plus, a regular routine will ensure productivity. Identify certain hours to study every week. You can pick how many and which ones, but decide on a core set of hours, with others you can add or omit as needed. Instruct members of your household not to interrupt you during those times unless there is blood or fire involved.

Have a designated study space and go there during your study time; your equipment and supplies will be at hand and you'll become conditioned to work when you're in that space. If you have children, arrange child care during your scheduled hours or plan to study when they're in bed or at school. Alternatively, study at work, the library, or another site away from home.

### ENTERING THE ZONE

Imagine an ideal performance state, a "zone of productivity" where your learning flows unimpeded as if from a greased mechanism. It's a lofty aspiration, but you can certainly make strides in that direction, starting today. After all, it will only take 15 minutes.

### PUTTING IT ALL TOGETHER

Keep in mind that there are many study methods available. The methods you've read about here are solid, specific approaches to common learning tasks. Nonetheless, they are by no means the only solutions available. If you want to learn additional study methods, check out your local bookstore and library for books about studying.

At first it may feel like the effort that it takes to be an active learner requires more time and energy than it's worth. But once you get into the swing of it, you'll find that the time you put into learning how to learn will be paid back ten times over; you'll be able to remember more and maybe even study less.

# Chapter 6

## Test Taking Techniques

If you asked learners to choose the aspect of the educational process that causes them the most anxiety, the overwhelming majority would cite tests. Why? Because a test presents an opportunity for failure, and nobody likes to fail. In fact, fear of failure sometimes leads people who know the material cold to blank out on test day, and just what they feared most would happen, does.

But wait a minute. Consider what will happen to you if you do fail a test. Will your coworkers burst into laughter when you return to the office? Will your spouse or lover leave you? Will you lose your job and, as a result, be unable to pay your mortgage, which will then cause you to lose your house and end up lying penniless, in a gutter and alone some cold night? Of course not.

So, putting first things first, don't blow this test thing out of proportion. If you don't pass the test, you'll probably have to take it again. Big deal. It might not be your idea of a good time, but it's hardly life-shattering. And the fact is, if you prepare effectively, you're infinitely more likely to succeed than fail.

### Before The Test

What constitutes effective preparation? Most importantly, it

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doesn't begin the night before the exam. As discussed earlier in this chapter, cramming is an ineffective learning tool and only marginally successful as a last-minute act of desperation. Pull an all-nighter and your mind may be stuffed with facts, but they will be shrouded in a fatigue-induced fog. When the fog dissipates, the facts are likely to go with it.

If, on the other hand, you've been studying throughout a course, you're already halfway prepared for the final exam. That's because you've GRASPed the majority of the information and only have to review and practice recalling it the way the test will ask you to.

The first step is to find out as much as possible about the format and content of the exam. Questions to answer include:

- \* What will you be expected to know?
- \* Which question format will be utilized--multiple choice, essay questions, or true-false? Currently most computer certification tests are multiple choice.
- \* How long will you have to complete the test?
- \* Will you be able to return to questions later if you skip over them?
- \* Will points be subtracted for wrong answers?

You should be able to obtain the answers to most of these questions from your certification sponsor, instructor, and/or testing center. Once you've identified the characteristics of the particular test, you can tailor your review methods accordingly.

Review the material that you've identified as likely to be on

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the test. Try to guess what questions will appear on the test and practice answering them. You can practice by reciting aloud, creating written or recorded self-tests, or using commercially available self-testing software and certification preparation guides. If you belong to a study group, quiz each other and discuss your answers.

Pay special attention to vocabulary and terminology words. Make certain you know exactly what they mean. If you don't understand a question, you won't be able to answer it.

Develop an overall test strategy, depending on the type of exam. The following advice focuses on multiple-choice exams, the most common format of current certification test questions. These exams, count an unanswered question the same way as an incorrect answer. If you won't be penalized for wrong answers (as opposed to skipping the question entirely) then it pays to guess when you don't know the correct answer.

On many exams you will be able to mark questions to return to later. When this is the case, be sure to **MARK** the questions or you will **NOT** be able to return to them. Answer the questions you're certain of first, marking the more challenging ones, and then return to the marked questions when you've finished the easy ones. This strategy enables you to answer a larger percentage of the questions and to answer the easiest ones right away.

The night before, do a brief review and remind yourself that you've prepared and are as ready as you're going to be. Don't stress yourself out pouring over your notes again and again. Instead, spend the evening in some pleasant, relaxing way, then get a good night's sleep so you'll be rested and ready to excel.

### The Day Of The Test

On the day of the test, allow yourself plenty of time to arrive at the test site. Would you rather arrive at the last minute, adrenaline pumping from the stress of too many red lights, or ten or fifteen minutes early, time you can easily fill with a final review of your note cards or trip to the restroom?

Make certain to bring several forms of identification, including a photo ID, and, of course, if you haven't already provided it, payment.

If you feel tense or anxious, apply a few relaxation techniques. One of the most basic is breathing. Take a deep breath, filling not just your chest, but every nook and cranny of your insides all the way down to your abdomen. Inhale from your navel, like a baby does. Exhale slowly, and feel your muscles relaxing as you your breath carries the tension out of your body. Repeat the breathing several times.

When the test begins, follow your preplanned strategy.

- \* If the test format is suitable, remember to go through and answer the easy questions first.
- \* Pay close attention to instructions. Are you supposed to select just one answer or all answers that apply?
- \* Read each question carefully, and twice. It's easy to misread a question and end up with the wrong answer as a result. It's also a waste and something you can avoid.
- \* Be alert for modifiers like *always*, *never*, *not*, and *except* that can radically affect the meaning of the



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question.

- \* Mentally answer the question *before* reading the answer choices. Then look for the choice that most accurately reflects your answer. This can spare you unnecessary confusion created by the test itself.
- \* If you don't know the answer, make an educated guess (see sidebar).
- \* If you finish before the time limit, and the software permits it (which isn't always the case) go back over the test and verify your answers. But *don't* change an answer unless you have good reason to believe it's wrong. Research indicates that when in doubt, our first guess is usually our best.

If other people are taking the exam at the same time, don't pay any attention to when they finish. Just because others are done before you doesn't mean that they will end up with a better score. Correspondingly, if you finish first, it doesn't mean you must have missed something. Take your time, keeping an eye on the exam clock if there's a time limit, and concentrate on regurgitating what you've learned. If you've prepared using effective techniques, such as the ones detailed in this chapter, you have nothing to worry about.

## Making an Educated Guess

If you find yourself facing a question you just don't know the answer to, consider guessing. If there are four possible choices, you automatically have a 25 percent chance of randomly selecting the correct answer. Apply some guessing techniques, and the odds shoot upward in your

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favor.

Successful guessing relies heavily on the process of elimination. For that reason, the first step is to eliminate any choices that are clearly wrong. If you have four answers to choose from, and you can discard two of them as incorrect, you've gone from a one in four chance of picking the right answer to a one in two chance.

Unless your exam format allows more than one answer choice for each question "all of the above" is basically equivalent to "more than one of the above." If "all of the above" is an option, and you can see at least two correct answers, then choose it.

Sometimes you'll find that, in the course of presenting the question and answers, one test item will provide hints that can help you answer another. Be alert for these and use them when you find them.

Many test-taking experts advise that if you have no idea which choice is correct, and "all of the above" is an option, you should choose "all of the above." By the same token, if you can't decide between two similar answers, choose the one that gives the most complete information.

## Adaptive Testing

The tests that most people are familiar with are linear. Every person who takes the test receives the same questions, often in the same order. But as you pursue certification, you may find yourself taking a different kind of test, called an adaptive test. You're especially likely to encounter one if you pursuing a certification sponsored by Novell or Microsoft.

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In adaptive testing, the number and order of questions varies each time the test is given. Exactly how these vary is decided by an algorithm in the testing program that is intended to dynamically assess the test subject's competency level.

Adaptive tests are given via computer. The first question given to any certification candidate is one that is judged to be of average difficulty. The computer program chooses which question to give next based on the candidate's response to the first question. If the question is answered correctly, then the next question is more difficult. If the answer to the first question is incorrect, an easier question is offered next.

This process continues throughout the test, with the computer algorithm analyzing the accuracy of previous answers to determine which question to ask next. The purpose is to pinpoint a candidate's competency level without subjecting him or her to questions that are obviously above or below the person's capabilities (per the program's algorithm). In this way the test is tailored (that is, adapted) to each test taker.

According to Novell, a pioneer of adaptive testing, the exam ends when "a) your ability is estimated with sufficient accuracy, b) the program is at least 95% confident that your ability score lies somewhere above the passing score, or c) the maximum number of questions is given." The maximum number of questions for Novell's adaptive tests is 25, and the minimum is 15.

Adaptive tests are shorter than their nonadaptive counterparts, and untimed. The sequence of questions is unique to each candidate. Because candidates see a small

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portion of the available question pool, security of test questions is easier to maintain.

When taking adaptive tests, candidates have no control over the order in which they answer questions. Once a question is presented, it's a now or never situation; you can't pass on a question and come back to it later.

Proponents of adaptive testing, which has been around in one form or another for about fifteen years, cite efficiency as the number one benefit. A test that typically takes an hour in the standard linear format can be administered in less than half that through adaptive technology. But from the candidate's perspective, the process can feel arbitrary and even unfair. Can a computer really calculate a person's ability level on the fly? What if you have the bad luck to get a question on the one area you don't have down cold? Perhaps these concerns address why adaptive testing is somewhat unpopular among certification candidates.

The most important aspect of test-taking is to know the material cold, but if you apply good test-taking strategies, your odds of success improve even further.

## Chapter 7

# Popular Certification Programs

Currently there are over 500 computer certifications offered by 150 certification vendors. Choosing from among such an extensive array of options can be confusing and difficult. The most complete list of certification programs on the Internet can be found on [GoCertify.com](http://GoCertify.com). There you will also find the [Certification Counselor](#), which can help you select the best program for your needs.

In addition to these tools, we have listed the most popular certifications below. Keep in mind there are many other programs that could prove equally valuable to you, but there are too many to list in this book, so we have chosen a selection of the most widely known programs. Because certification vendors often change their Web sites around, which breaks html links, the certifications listed below link back to their pages on [GoCertify.com](http://GoCertify.com). [GoCertify](http://GoCertify.com) pages are frequently updated with the currently functional vendor links.

## Networking and Operating Systems

## Keys to Certification Success

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### Microsoft Corporation

Microsoft Corporation offers two main networking certifications: [Microsoft Certified Systems Administrator \(MCSA\)](#) and [Microsoft Certified Systems Engineer \(MCSE\)](#). The MCSA is a stepping stone to the MCSE. Both of them cover networking with the Microsoft operating system and require passing multiple exams.

### Cisco Systems

Cisco Systems offers two levels of certification – the career certifications, and the premier Cisco Certified Internetworking Expert (CCIE) title. Cisco's certifications focus on Cisco hardware and software solutions, as well as general networking knowledge.

The career certifications include [Cisco Certified Network Associate \(CCNA\)](#), [Cisco Certified Network Professional \(CCNP\)](#), [Cisco Certified Design Associate \(CCDA\)](#), and the [Cisco Certified Design Professional \(CCDP\)](#). The CCNA is popular first networking certification.

The [CCIE](#) is one of the top computer certifications, in terms of associated pay rates. It is very difficult to earn, requiring passage of both a written exam and an intense hands-on lab exam.

### Novell Corporation

Novell offers certification in the Novell operating system, and on Linux. The [Certified Novell Administrator](#) is the entry level Novell certification, followed by [Certified Novell Engineer \(CNE\)](#), and the more advanced [Master Certified Novell Engineer \(MCNE\)](#). The CNA is a one exam certification, while the CNE requires several additional exams, and the MCNE several more after that.

## Keys to Certification Success

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A newer certification from Novell is the [Certified Linux Professional \(CLP\)](#). This is an entry-level certification for people interested in being Linux administrators.

### **Red Hat Inc.**

Red Hat offers three levels of certification on Linux, with focus on the Red Hat distribution of Linux. Each of them requires passing a hands-on lab exam. The middle level certification – [Red Hat Certified Engineer \(RHCE\)](#) is the most well known and respected of the three, as it has been around the longest. The entry level Red Hat certification is [Red Hat Certified Technician \(RHCT\)](#). The newest, and highest level Red Hat offering is [Red Hat Certified Architect \(RHCA\)](#).

### **Computing Technology Industry Association (CompTIA)**

CompTIA offers a one exam, vendor neutral certification named [Network+](#). It is an entry-level certification covering basic networking knowledge.

### **More Networking /Operating System Certification Vendors**

Networking and operating system focused certifications are also available from Apple Computer ([Apple Certified System Administrator](#)), Sun Microsystems ([Solaris operating system](#)), Hewlett-Packard (covers HP operating systems), IBM ([Certified Specialist](#)), Nortel ([covers Nortel Networking products](#)), and [Citrix Systems Inc.](#) (Covering Citrix products including MetaFrame or WinFrame).

## Application Development

## Keys to Certification Success

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### Microsoft Corporation

Microsoft offers two developer certifications: [Microsoft Certified Application Developer \(MCAD\)](#) and [Microsoft Certified Solutions Developer \(MCSD\)](#). The MCAD title requires passing 3 exams – two core exams and one elective. Choose from several different programming languages. The MCSD adds two more exams.

### Sun Microsystems

Sun offers several popular certifications related to Java programming and development. The [Sun Certified Java Programmer \(SCJP\)](#) is the entry level title in this group, and requires passing a single exam covering the Java development environment. The [Sun Certified Java Developer \(SCJD\)](#) is next, requiring an additional exam, plus completion of a hands-on assignment.

Other Sun Java certifications include Sun [Certified Business Component Developer](#), [Sun Certified Developer for Java Web Services](#), [Sun Certified Mobile Application Developer](#), and [Sun Certified Enterprise Architect for Java Technology](#).

### American Society for Quality (ASQ)

The [Certified Software Quality Engineer \(CSQE\)](#) is designed for those who have a comprehensive understanding of software quality development and implementation; have a thorough understanding of software inspection and testing, verification, and validation; and can implement software development and maintenance processes and methods.

### IBM



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IBM offers a full slate of development certifications organized around different product lines. Available designations include [IBM Certified Developer](#), [IBM Certified Solution Developer](#), [IBM Certified Solutions Expert](#), and several others.

### **Zend**

If you develop programs using PHP, consider Zend's vendor neutral [Zend Certified PHP Engineer](#) title. This is a one exam certification.

### **Macromedia**

Macromedia is the vendor of several popular Web development tools, including Flash, ColdFusion, and DreamWeaver. [Certifications are available](#) for each of these products.

## Security

### **International Information Systems Security Certification Consortium (ISC2)**

One of the most popular and well-respected security certification is the [Certified Information Systems Security Professional \(CISSP\)](#). This certification is for experienced professionals in the computer security field who are responsible for developing the information security policies, standards, and procedures and managing their implementation across an organization.

### **Computing Technology Industry Association (CompTIA)**

For individual with little or no security experience to draw upon, CompTIA's [Security+](#) is a good place to start. It is an entry-level, vendor neutral certification.

## Keys to Certification Success

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### **Check Point Software Technologies Ltd**

Check Point offers a variety of security certifications related to its VPN and Firewall products. The first level certification is [Check Point Certified Security Administrator \(CCSA\)](#). A half-dozen more options follow, capped by the [Check Point Certified Security Instructor \(CCSI\)](#).

### **SANS (System Administration, Networking, and Security) Institute**

[The SANS institute](#) offers a wide array of security certifications, ranging from audit and control designations and security essentials through intrusion analysis, security for system administrators, firewall and perimeter defense, and many more.

### **International Council of E-Commerce Consultants (EC-Council)**

The EC-Council is another vendor of security certifications. They offer a variety of titles, of which perhaps the most interesting is the [Certified Ethical Hacker \(CEH\)](#). The CEH is for individuals who are responsible for securing (or testing the security of) computer networks. Covers common exploits, vulnerabilities, and countermeasures.

### **Information Systems Audit and Control Association (ISACA)**

The ISACA offers several well-respected certifications in the security arena. [Certified Information Systems Auditor \(CISA\)](#) is for individuals who work in the information systems audit, control and security profession, while [Certified Information Security Manager \(CISM\)](#) is for individuals who provide information security management

## Keys to Certification Success

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and consulting. It is business-oriented and focuses on information risk management while addressing management, design and technical security issues at a conceptual level.

## Storage Networking

### **Storage Networking Industry Association (SNIA)**

SNIA offers three certifications related to storage networking. [SNIA Certified Professional \(SCP\)](#) starts the list, and is the program's entry level designation and requires passing a single, foundations exam. Additional titles include [SNIA Certified Systems Engineer \(SCSE\)](#), which covers management and administration and [SNIA Certified Architect \(SCA\)](#), which covers planning and design.

### **Cisco Systems**

Cisco offers two storage networking certifications. [Cisco Storage Networking Design Specialist](#) is for individuals who are responsible for selecting and integrating Cisco storage products to design a storage networking solution. [Cisco Storage Networking Support Specialist](#) is for individuals who are responsible for installing, configuring, and troubleshooting Cisco storage products in a storage networking environment.

### **IBM – Tivoli**

There are many [Tivoli-focused certifications](#) available from IBM.

## Internet/Web

## Keys to Certification Success

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(also check under the Application Development heading)

### **Computing Technology Industry Association (CompTIA)**

A basic, entry-level Internet certification is CompTIA's [i-Net+](#). This is a one-exam certification for hands-on specialists responsible for implementing and maintaining Internet, Intranet and Extranet infrastructure and services as well as development of related applications.

### **ProsoftTraining**

The [Certified Internet Webmaster \(CIW\) program](#) from ProsoftTraining is a really good collection of Internet-focused certifications. Start with the [associate](#) level (basic certification) and move on to more advanced or specialized titles such as the [CIW Designer](#) or [CIW Security Analyst](#).

## Database

### **Oracle Corporation**

An Oracle certification would add a definite boost to most IT resumes, and Oracle offers [plenty to choose among](#). The program is organized in three tiers, as Oracle Certified Associate (OCA), Oracle Certified Professional (OCP), and Oracle Certified Master (OCM). There are both developer and administrator tracks available.

### **Microsoft Corporation**

Microsoft offers one database-focused certification: [Microsoft Certified Database Administrator \(MCDBA\)](#). The certification incorporates 3 core exams covering Microsoft SQL Server products, plus an elective.

## Keys to Certification Success

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### MySQL Inc.

MySQL is the most popular open source database, and fortunately there are several certifications available to credential expertise in its use. [Certified MySQL Professional](#) is for people who install MySQL from scratch and keep it running. This is the main MySQL certification, but before you can earn it you'll need to achieve [MySQL Core Certification](#), which is for people who maintain data in company databases, performing data analysis, importing and exporting data, and similar tasks.

[Teradata](#), a Division of NCR, and [Sybase](#) also both run well-respected certification programs offering an array of database certification options.

## Wireless

### Planet3Wireless

The primary certification option for wireless technology comes from Planet3Wireless. This is a vendor-neutral program. The first level in this program is the [Certified Wireless Network Administrator](#). From there you can choose several more advanced designations including [Certified Wireless Security Professional](#).

### Cisco Systems

Cisco has two wireless certifications: [Cisco Wireless LAN Design Specialist](#) and [Cisco Wireless LAN Support Specialist](#). Both of these are structured around Cisco wireless LAN products.

## Trainer

## Keys to Certification Success

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### CompTIA

There are very few vendor-neutral trainer certifications. The most well known is the [CTT+](#) (Certified Technical Trainer +) from CompTIA. CompTIA CTT+ Certification is a cross-industry credential recognizing excellent instructional abilities. A CTT+ certification demonstrates core competencies that include instructor knowledge and credibility, classroom performance, and effective communication and presentation skills.

To earn the CTT+ you must pass a computer-based assessment and submit a video demonstrating your instructional skills.

### Microsoft Corporation

Many of the major computer vendors, such as Microsoft, offer trainer certifications. [Microsoft Certified Trainer \(MCT\)](#) is one of the best known and probably most valuable. This is required of anyone who wants to teach using the official Microsoft curriculum.

Before you can earn MCT certification you must first hold one of Microsoft's other premiere certifications (MCSE, MCDBA, or MCSA). You must attend an official Microsoft course (at least 3 days long) taught by an MCT within 12 months prior to your application. You must also demonstrate your skills as a trainer.

Vendor-specific trainer certifications are also available from Cisco Systems, CheckPoint Software Technologies, and Citrix, among others.

## Project Management

### Project Management Institute

## Keys to Certification Success

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The Project Management Institute (PMI) offers a certification that's largely in a category of its own: [Project Management Professional](#) (PMP). This certification has substantial experience requirements along with an 8 section PMP exam. Continuing education is required in order to maintain certification.

The above certifications provide a broad representation of what's available. There are many highly specialized titles available, as well as generalist designations. The important things to keep in mind when choosing a certification are to make sure the designation is a good fit with your career goals, and that it is run by a reputable, established company or organization. Then pursue it in the spirit it was intended –don't take shortcuts that will speed you on your way at the cost of real knowledge. Good luck, and I wish you the best in your quest to get successfully certified.

### About the Author

Anne Martinez has been writing about certification for more than seven years. She is the author of three editions of *Get Certified & Get Ahead* as well as *Get Cisco Certified & Get Ahead*, and *Get Linux Certified & Get Ahead* (all McGraw-Hill). She is also the founder and editor-in-chief of GoCertify.com, a leading site about computer certification. As part of her studies of certification, Anne has earned both MCSE and CCNA certifications.

Anne has also written many freelance articles, for publications such as *Certification Magazine*, *Contract Professional*, *Inside Technology Training*, *Parenting*, and many others. She also authored *Cheap Web Tricks: Build and Promote a Successful Web Site Without Spending a Dime* (McGraw-Hill, 2001).