

**Using Internships and Input from Businesses to
Guide the development of a Computer Technician Course**

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Abstract

This paper discusses the process of developing a computer technician’s course for the Associate degree program in computer systems. The paper discusses how the faculty perceived a need to develop such a course, and the process used to develop it. Students who had internships were asked to list the activities they did in their internships. And then this list was used to develop a survey that was then sent to department’s advisory board, as well as to the heads of IT in different businesses, and also to a number of IT professionals. In this survey the respondents were asked to rate the skills and knowledge areas they believe are important for an intern or a fresh graduate to have. The results of this survey are then presented and discussed and key areas are highlighted. After the course was developed and taught for the first time, feedback was collected from the students who took the newly offered course. This feedback (will be presented in a future paper) was collected through an online survey that the students were asked to complete after they took their final exams.

Developing the Course and the survey

All students in the bachelors program in computer systems technology have to take an internship course, in which they are placed as interns in a business and are expected to perform the technical duties assigned for one semester. The feedback received from those businesses seemed to indicate that although the students have strong general technical skills, they seem to lack some key basic skills like installing a memory module, or a hard drive in a defective computer. This motivated the faculty to develop a questionnaire and collect feedback from businesses as to what they need students in an internship to be able to do. The responses collected then guided the development of a computer management course that would be mandatory at the associate level. This course would in turn later help the students perform better during their internship experience.

At the beginning, the faculty in charge believed that this new course will mainly cover a lot of electrical concepts like voltage measurement, circuits, generators. As we started getting feedback from business, it became clear that businesses were seeking other skills. Table 1. shows the results received from 65 IT professionals.

Electrical Course Content Survey				
	Questions	Extremely	Sometimes	Not Needed
1	Measurement of voltage and current, Ohms Law	25	33	42
2	D C Series, Parallel circuits, power. Kirchoff Laws	12	37	52
3	A C circuits, Inductance, Reactance	15	32	53
4	Capacitance, Reactance, Impedance	12	35	53
5	A C Series/Parallel Circuits	18	35	47
6	Generators, Motors, Resonance, Bandwidth	8	55	37
7	Diodes, Rectification, Transistors, Amplifier, logic Gates	15	42	43
8	Mother Board, processors, chip sets	50	27	23
9	Upgrading Memory, Addressing Memory	70	18	12
10	Install and Partition Hard drives. Format and Test Hard Drive with Scandisk	68	23	8

11	Addressing Hard Drives	70	20	10
12	Printer Installation and Diagnostic (Stand alone, Network)	67	20	13
13	Install Windows XP, Manage user's Accounts, Back and restore files in Windows XP	68	23	8
14	Systems Management, Set disk quotas, use of encryption	63	17	20
15	Install Multiple Media Devices: CD/DVD, drives, Explore Windows XP Audio features. Install Dual Monitors in Windows XP, research digital cameras.	58	32	10
16	Download and Install Explorer 7 and Firefox. Configure the IP Address and subnet mask for a PC. Update the Windows and Web browsers	58	30	12
17	Install and Test Ethernet NIC; share resources on a network: Troubleshoot, with TCP/IP utilities.	63	25	12
18	Download and Install Anti-Virus software; personal files; configure the security and privacy level in PC. Delete cookies and passwords	65	27	8
19	I/O Systems, Ports	58	33	8
20	RAID	45	43	12
21	ATA, SATA, SCSI	40	47	13
22	Maintenance and Repair of Laptops	60	27	13
23	Numbering Systems: Binary, Decimal, Hex-Decimal Character Types:	30	43	27

Table 1. Results of Survey

By adding the “extremely”, and “sometimes” responses, one would get the following table (table 2.).

	Questions	%Agree	%Disagree
1	Measurement of voltage and current, Ohms Law	58%	42%
2	D C Series, Parallel circuits, power. Kirchoff Laws	48%	52%
3	A C circuits, Inductance, Reactance	47%	53%
4	Capacitance, Reactance, Impedance	47%	53%
5	A C Series/Parallel Circuits	53%	47%
6	Generators, Motors, Resonance, Bandwidth	63%	37%
7	Diodes, Rectification, Transistors, Amplifier, logic Gates	57%	43%
8	Mother Board, processors, chip sets	77%	23%
9	Upgrading Memory, Addressing Memory	88%	12%
10	Install and Partition Hard drives. Format and Test Hard Drive with Scandisk	92%	8%
11	Addressing Hard Drives	90%	10%
12	Printer Installation and Diagnostic (Stand alone, Network)	87%	13%
13	Install Windows XP, Manage user's Accounts, Back and restore files in Windows XP	92%	8%
14	Systems Management, Set disk quotas, use of encryption	80%	20%
15	Install Multiple Media Devices: CD/DVD, drives, Explore Windows XP Audio features. Install Dual Monitors in Windows XP, research digital cameras.	90%	10%
16	Download and Install Explorer 7 and Firefox. Configure the Ip Address and subnet mask for a PC. Update the Windows and Web browsers	88%	12%
17	Install and Test Ethernet NIC; share resources on a network: Troubleshoot, with TCP/IP utilities.	88%	12%
18	Download and Install Anti-Virus software; personal files; configure the security and privacy level in PC. Delete cookies and passwords	92%	8%
19	I/O Systems, Ports	92%	8%
20	RAID	88%	12%

21	ATA, SATA, SCSI	87%	13%
22	Maintenance and Repair of Laptops	87%	13%
23	Numbering Systems: Binary, Decimal, Hex-Decimal Character Types:	73%	27%

Table 2. Results of Survey with Agree or Disagree

By sorting using the agree percentage, it becomes clear that the following skills/knowledge are highly prized by the surveyed group (see table 3.):

- Download and Install Anti-Virus software; personal files; configure the security and privacy level in PC. Delete cookies and passwords
- Install and Partition Hard drives. Format and Test Hard Drive with Scandisk
- Install Windows XP, Manage user's Accounts, Back and restore files in Windows XP
- I/O Systems, Ports
- Addressing Hard Drives
- Install Multiple Media Devices: CD/DVD, drives, Explore Windows XP Audio features. Install Dual Monitors in Windows XP, research digital cameras.
- Download and Install Explorer 7 and Firefox. Configure the Ip Address and subnet mask for a PC. Update the Windows and Web browsers
- RAID
- Upgrading Memory, Addressing Memory
- Install and test Ethernet NICs; share resources on a network: Troubleshoot, with TCP/IP utilities.
- Maintenance and Repair of Laptops
- Printer Installation and Diagnostic (Stand alone, Network)
- ATA, SATA, SCSI
- Systems Management, Set disk quotas, use of encryption
- Mother Board, processors, chip sets

The least popular skills/knowledge were:

- Generators, Motors, Resonance, Bandwidth
- Measurement of voltage and current, Ohms Law
- Diodes, Rectification, Transistors, Amplifier, logic Gates
- A C Series/Parallel Circuits
- D C Series, Parallel circuits, power. Kirchhoff Laws
- A C circuits, Inductance, Reactance
- Capacitance, Reactance, Impedance

Questions	%Agree	%Disagree
Download and Install Anti-Virus software; personal files; configure the security and privacy level in PC. Delete cookies and passwords	92%	8%
Install and Partition Hard drives. Format and Test Hard Drive with Scandisk	92%	8%
Install Windows XP, Manage user's Accounts, Back and restore files in Windows XP	92%	8%

I/O Systems, Ports	92%	8%
Addressing Hard Drives	90%	10%
Install Multiple Media Devices: CD/DVD, drives, Explore Windows XP Audio features. Install Dual Monitors in Windows XP, research digital cameras.	90%	10%
Download and Install Explorer 7 and Firefox. Configure the Ip Address and subnet mask for a PC. Update the Windows and Web browsers	88%	12%
RAID	88%	12%
Upgrading Memory, Addressing Memory	88%	12%
Install and Test Ethernet NIC; share resources on a network: Troubleshoot, with TCP/IP utilities.	88%	12%
Maintenance and Repair of Laptops	87%	13%
Printer Installation and Diagnostic (Stand alone, Network)	87%	13%
ATA, SATA, SCSI	87%	13%
Systems Management, Set disk quotas, use of encryption	80%	20%
Mother Board, processors, chip sets	77%	23%
Numbering Systems: Binary, Decimal, Hex-Decimal Character Types:	73%	27%
Generators, Motors, Resonance, Bandwidth	63%	37%
Measurement of voltage and current, Ohms Law	58%	42%
Diodes, Rectification, Transistors, Amplifier, logic Gates	57%	43%
A C Series/Parallel Circuits	53%	47%
D C Series, Parallel circuits, power. Kirchhoff Laws	48%	52%
A C circuits, Inductance, Reactance	47%	53%
Capacitance, Reactance, Impedance	47%	53%

Table 3. Results of Survey sorted

Discussion and conclusion

It is clear from the above results that there is strong agreement on the skills and knowledge that an intern/fresh graduate needs to possess. Notice for example that 92% of respondents believed that knowing how to install an anti-virus program is a needed skill. This and other skills though usually get overlooked while courses are being developed. We seldom teach students how to install a hard drive, or repair a PC, but instead focus on general theoretical concepts. Although those theoretical concepts are important, they usually are of little use to the fresh graduate or to the intern when specific skills are needed to get the job done. There is a need to strike a balance between teaching theoretical knowledge and practical skills that students and fresh graduate can use on their first day on the job.