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# Considerations for Computer Ownership Policies

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## Abstract

The introduction of Internet technology is changing the way people communicate, work and live. In business environments, individuals are using electronic networks instead of the traditional methods to accomplish their goals. Furthermore, as more industries implement new applications of technology, the pressure on employees and consumers to acquire new skills increases. The result is an urgent need for higher learning institutions to adopt computer and technology protocols that leverage network resources to deliver on demand services. As an option, institutions are turning to the capabilities of wireless technology to create wireless network campuses. Although it appears to be an ideal solution, both the challenges and the opportunities require careful consideration.

## 1. Introduction

On a national level, academic institutions, recognizing the demand for graduates capable of succeeding in a technology driven economy, are developing and implementing computer ownership policies and standards. Currently, California State Polytechnic University of Pomona is considering the development of a notebook requirement for undergraduate e-business students in the College of Business Administration. The question then becomes what type of computer ownership program or policy to implement. Should students be required to own a desktop computer or a notebook computer, similar to the University of Florida policy? Should academic institutions offer a recommendation only, such as that offered by University of Indiana? To answer these questions, various issues must be explored.

There are various issues to consider when developing computer ownership standards and policies, for example, student demand, faculty willingness to incorporate new tools into existing curriculum, and what is the availability of technology and resources. For example, are the students willing to accept the use of new technology to facilitate learning when the current methods have previously been successful? Would students from other degree programs accept a computer or notebook requirement? Another, item to consider, involves the current and expected use of wireless technology? These are just a few of the questions that require careful attention when considering implementing a computer

ownership policy. The following takes a closer look into the struggle of one university to provide quality education in an ever-changing environment. Lastly, similar policies currently implemented at other institutions, such as the University of Florida, University of Indiana, and Georgia Tech University, serve as a comparison model for California State Polytechnic University of Pomona to develop their own computer policy.

## 2. California State Polytechnic University of Pomona seeks to establish Policy

California State Polytechnic University of Pomona is constantly anticipating the demands of the economy. The College of Business Administration is especially interested in changes in business practices. In the fall of 2001, Cal Poly, Pomona launched a new concentration within the Bachelor of Science in Business Administration. The E-business Concentration developed in response to today's evolving business environment, which demands graduates be equipped with a thorough understanding of e-business theory and practice.

The E-business Concentration (EBZ) is responsive to the markets' increasing emphasis on the use of technology related skills. In addition to technical skills, the field of e-business requires that professionals be equipped with interpersonal abilities. To support the development of these skills, students work in teams with an extensive emphasis on group collaboration. The College of Business Administration practices a "learn by doing" approach to management education, which encourages the support and development of programs that facilitate the learning process.

In keeping with this philosophy, Dean Eduardo Ochoa of the College of Business Administration sought to utilize available resources in technology to facilitate learning. In particular, Ochoa saw the usage of notebook computers as a viable tool to accomplish the objectives of CBA and the EBZ Concentration. Courses in the curriculum involve a structure based on team collaboration. Therefore, a notebook computer is an excellent tool because it offers mobility and the ability to access learning anytime and anywhere.

## 3. Earlier Notebook Requirement for Cal Poly, Pomona's MBA/MSBA Program

Currently, the College of Business Administration at Cal Poly, Pomona has a laptop requirement for their MBA/MSBA program. However, the laptop requirement policy encountered unexpected obstacles once implemented. The initial proposal overlooked how the new requirement would be incorporated into the curriculum. The CBA faced an enormous dilemma because, at the time, the majority of the Faculty lacked sufficient computer and Internet knowledge to incorporate such a requirement into existing curriculum. In addition, there was little incentive for the faculty to incorporate the use of notebooks in their course outlines.

Soon, the MBA/MSBA students expressed resentment towards the requirement. Their primary complaint revolved around the fact that Instructors were not incorporating the use of the notebooks in the classroom. To address this issue, in the summer of 2001, Ochoa, 'provided faculty with the opportunity to apply for support to develop innovative and creative ways to incorporate an instructionally relevant component of their classes, which would use the notebooks in a meaningful way (McLaughland, 2001).' Of the proposals submitted, 5 stipends were approved and implemented during the following quarter.

#### **4. Gathering Support for Notebook Requirement Policy**

New policies or initiatives typically involve gathering feedback from those affected most. When Georgia Institute of Technology began their student computer policy implementation in 1995, the President G. Wayne Clough appointed a Student Computer Ownership Committee ("STUDENT COMPUTER OWNERSHIP," 2002). The committee brought together students, faculty, and staff, to study the various trends and attitudes toward a proposal to require computer ownership of all enrolled students. Once the review process was finalized, a student computer ownership policy was recommended by Georgia Tech faculty requiring all students with the class of 2002 to have their own computer.

In keeping with a similar concept, Cal Poly of Pomona and the College of Business Administration initiates the process by incorporating student and faculty feedback. Due to a lack of enthusiasm from both the faculty and the MBA/MSBA students, there are additional feelings of apprehensive about implementing such a program for undergraduate students, without sufficient evidence of both student and faculty support. As a result, during winter term 2002, Dean Ochoa suggests to first determine how receptive EBZ students are of a notebook requirement.

In February 2002, the E-Business Society, a professional student organization, initiates to assist the CBA with the notebook requirement project, by

conducting a survey. Dr. Robert Schaffer, Professor of International Business and Marketing and E-Business Society, Faculty Advisor, and John Tang, E-Business Society member, develop a questionnaire to administer to a sample size of approximately 200 students enrolled in EBZ courses. The survey objective is to determine the attitudes and level of cooperation from Cal Poly E-business students to a laptop requirement. Secondly, the survey gathers the student perspective on purchasing options. The results of the survey, supports the hypothesis that E-business students favor having a laptop requirement.

See exhibit 1 and 2.

#### **5. Available Resources: Hardware Requirements**

The results from the survey show sufficient evidence to conclude Cal Poly of Pomona undergraduate students are supportive of a notebook requirement. The following recommended step is to establish minimum configuration standards for hardware and software. The E-Business Society collaborates with students in the EBZ program to compile a list of the minimum specifications required of the e-business concentration, utilizing informal email surveys. Prior to completion of this list, the Society sought input from Richard Van Lommel, Senior System Administrator Consultant for the College of Business Administration of Cal Poly, Pomona. Van Lommel plays a significant role because of his involvement in implementing the notebook requirement for the MBA/MSBA program (Personal communication, August 9, 2002). After careful evaluation, he recommended for the minimum configuration to be offered as a baseline standard and provide the more robust configuration model as the recommend configuration. (See exhibit 3).

#### **6. Wireless Access**

Wireless access is available to students, in building 6, on the Cal Poly, Pomona campus. To connect to the network students will require a computing device capable of using a wireless adapter card and a wireless adapter that supports the IEEE 802.11b standard. Previously, the University was undecided on which wireless card brand to use (L. Turner, personal communication, July 17, 2002). There were issues of security and concerns with longevity of Cisco cards. In a recent development, the concerns and issues were resolved and the decision to use Cisco is confirmed (R. Van Lommel, personal communication, August 9, 2002). The Cisco Aironet 350 wireless client adapter (AIR-PCM352), is available through the Bronco Bookstore for \$120.00. Although there are also older 340 series adapters available and possibly available at a lower price, the newer cards have a higher power output capability and more advanced performance features.

## **7. Evaluation of Other Computer/Notebook Policies**

Cal Poly of Pomona is committed to the professional development of its' students. A portion of the research complies samples to better understand what was meant. I Part of the process evaluate various other models of existing standards. The following are the current computer/notebook policies and recommendations for Indiana University and Florida University. They serve as an example of different ways to implement such policies within the College of Business Administration.

### **7.1 Case 1 Indiana University, Kelley School of Business**

**<http://www.bus.indiana.edu/ugrad/compinfo.html>**

The University of Indiana currently does not require undergraduate students within the Kelley School of Business to own a computer. However, they recognize that various undergraduate programs in the Kelley School of Business expect to incorporate the use of networked (wired/plug-in) classrooms over the next three to four years. In addition to the use of wired/plug-in classrooms, all undergraduate dormitories are wired for network connectivity.

The University of Indiana considers a computer to be a wise investment. Although, notebooks provide mobility and may connect to the UI network from various academic buildings, the Kelley School of Business encourages undergraduate students to consider purchasing the less convenient and less expensive hardware choice. Their recommendation is for students to purchase a decent desktop system for no more than \$1,500. The University, also, provides suggested minimum hardware guidelines in order to use all the technology services available at IU. (See exhibit 4) To accommodate their recommendation, the University has negotiated various pricing plans with numerous vendors. Students have access to the vendor links from the IU website. The vendors include Apple, Dell, Gateway and the IU Bookstore. For an example of a recommended laptop configuration, (see exhibit 5).

### **7.2 Case Study 2: University of Florida, Warrington College of Business**

**<http://www.cba.ufl.edu/programs/computer.asp>**

The University of Florida has an official policy on the student computer requirement. Their policy stipulates beginning summer term 1998 all junior level and new incoming students must purchase computer hardware and software appropriate to his or her degree program. Students may not graduate unless computer proficiency is demonstrated. The policy continues with the expectation that all students will purchase or lease a computer capable of accessing the Internet, through dial up or network

connections, and posses' productivity programs for spreadsheets and various calculations.

The University provides the minimum computer configurations for all students. (See Exhibit 6). Individual colleges may have additional requirements or recommendations for lower division, upper division, graduate and professional students.

The Warrington College of Business stipulates that all junior, senior and master level students must have a notebook computer. For an example of these requirements, see exhibit 7. The College of Business has also established negotiated prices from Dell and IBM. The links are available online.

## **8. Available Models for California State Polytechnic University of Pomona**

The decision to implement a computer/notebook policy or standard is relatively difficult because there are numerous models available. However, with student support, wireless network standard established, as well as vendor support, the decision is less complex.

The first option for Cal Poly Pomona is to delay implementation of any computer standard/policy. One benefit to the University is in cost savings, in the event a new technology for wireless networks is developed, making the existing infrastructure obsolete. The drawback to the University is the loss in revenue due to lower enrollment. Students will prefer to attend other universities because they offer innovative programs demanded by the market.

The second option available to Cal Poly, Pomona is to approve a minimum configuration standard to offer as a recommendation only for students. The policy resembles the policy adopted by Indiana University. The university benefits because it will be perceived by others an innovative campus with extensive knowledge of the inner workings of technology. In addition, the campus will benefit with a slight increase in enrollment once the policy is added to the CBA web site. Furthermore, students will appreciate the opportunity to access the current negotiated discounts available to all faculty, staff and students within the California State University System. However, since this model is offered as a recommendation, the drawback for students requiring financial assistance is that financial aid is not offered.

The third option available is a model similar to the University of Florida, Warrington College of Business. The College of Business offers a recommendation only for hardware and software configurations to all concentrations. The Cal Poly Pomona policy would offer a notebook requirement to junior and senior level EBZ students. However, the College may offer to extend the requirement to CIS students since their use of computing

tools is extensive and would also benefit from these policies. If a laptop requirement is implemented, those students in financial need will have access to financial aid monies. Furthermore, the College of Business will benefit from an increase in enrollment as a result of the laptop requirement.

The fourth option available to Cal Poly, Pomona is a model similar to the California State University of Bakersfield. Their model offers information resources information as a means to increase the knowledge and understanding of the students. The University Web site provides recommendations for both PC and Mac computers. Students may purchase software at students' prices from the information resource page.

## 9. Conclusion

The status of Cal Poly of Pomona's Notebook Initiative is currently undergoing further consideration. The objective is to take all possible scenarios into account before imposing such a costly requirement upon the students. Although careful consideration is recommended, each day that passes without a computer/notebook policy

implemented, is a disservice to the students. Students are at a disadvantage when they do not receive the skills, nor the education demand by the new Internet technology enabled economy.

## References

- [1] *Equipment Standards Policy and Purchasing Recommendations* (August 13, 2002) Retrieved July 19, 2002, from The CSUB Information Resources, Web Site: <http://www.csusbak.edu/infores/Standards/hardware/>
- [2] *McLaughland, E., 2001. The Directors Message* [online]. California State Polytechnic University, Pomona. Available from: <http://www.csupomona.edu/%7Emba/enewsletter/Fall%202001/index.html> [Accessed 15 August 2002]
- [3] *STUDENT COMPUTER OWNERSHIP INITIATIVE (February 2002)* Retrieved August 9, 2002, from The Georgia Institute of Technology, Office of Enrollment Services, Web site: <http://www.sco.gatech.edu/downloads/sco2002.doc>

## Appendix

### Exhibit 1 Survey Questionnaire Excerpt

E-Business Society

The E-Business Society is collecting data so that we might make recommendations to the college administration concerning the possibility of either requiring or encouraging EBZ majors to have laptop computers. Thank you for your time in completing this survey.

1. What is your Major? \_\_\_\_\_  
 What is your Career \_\_\_\_\_  
 Track within this major? \_\_\_\_\_
2. Gender  
☐ Female  
☐ Male
3. Approximately, what is your annual household income?  
☐ 0-\$10,000  
☐ \$10,001-\$20,000  
☐ \$20,001-\$30,000  
☐ \$30,001+
4. On average, how often do you check your e-mail?  
☐ Continuously (DSL, LAN or network connection)  
☐ 3-4 times  
☐ At least once  
☐ Perhaps once every 2-3 days  
☐ Once a week or less
5. Excluding e-mails, about how many hours each week, on average, do you spend on line?  
 \_\_\_\_\_ hrs/week

Thank you for your time.

## Exhibit 2 Excerpt from Results of the Survey

### E-Business Laptop Survey

#### Background

**Management Decision Problem:** E-business graduates are going to enter a high technology job environment. In order to succeed in an environment such as this and meet the necessary challenges E-business graduates will need to have all the necessary tools, giving them the best opportunity for success.

**Research Objectives:** To determine the attitudes and level of cooperation from Cal Poly E-Business students to a possible laptop requirement. As well as attitudes toward laptop purchasing options.

**Hypotheses:** The majority of e-business students will show more favoritism toward a laptop requirement. E-Business students are using computers and the Internet a great deal in their classes and surely will see the need to become better acquainted with hardware and software tools.

**Significance of the Study:** This study will show that students are serious about the need for technology in their education. It will also show teachers the importance of implementing these technologies into the educational process. Corporations may also find through this survey that Cal Poly students have a high level of technical proficiency and a great desire to maintain and increase that through their education. Laptop vendors will also find that Cal Poly students will respond to the laptop requirement with full cooperation.

**Information Needs:** The following information was taken for this study:

Major	Amount of time on the internet
Gender	Current computer
Income	Importance of PC
Frequency of E-mail usage	Pricing
Monthly payment	Financial Aid
Requirement	Payment options

#### Descriptive Results

Question 1: What is your major?

MAJOR					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	49	24.5	24.5	24.5
	2.00	26	13.0	13.0	37.5
	3.00	50	25.0	25.0	62.5
	4.00	18	9.0	9.0	71.5
	5.00	37	18.5	18.5	90.0
	6.00	6	3.0	3.0	93.0
	8.00	3	1.5	1.5	94.5
	9.00	1	.5	.5	95.0
	10.00	1	.5	.5	95.5
	11.00	1	.5	.5	96.0
	14.00	4	2.0	2.0	98.0
	15.00	2	1.0	1.0	99.0
	16.00	1	.5	.5	99.5
	17.00	1	.5	.5	100.0
	Total	200	100.0	100.0	

Question 2: Gender

GENDER					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	82	41.0	41.0	41.0
	2.00	118	59.0	59.0	100.0
	Total	200	100.0	100.0	

Question 3: Approximately, what is your annual household income?

INCOME					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	53	26.5	26.5	26.5
	2.00	36	18.0	18.0	44.5
	3.00	23	11.5	11.5	56.0
	4.00	88	44.0	44.0	100.0
	Total	200	100.0	100.0	

Question 4: On average, how many times do you check your e-mail?

TIMES					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	73	36.5	36.5	36.5
	2.00	62	31.0	31.0	67.5
	3.00	43	21.5	21.5	89.0
	4.00	19	9.5	9.5	98.5
	5.00	3	1.5	1.5	100.0
	Total	200	100.0	100.0	

Question 6: What type of computer do you currently own?

COMPTYPE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	134	67.0	67.0	67.0
	2.00	9	4.5	4.5	71.5
	3.00	49	24.5	24.5	96.0
	4.00	8	4.0	4.0	100.0
	Total	200	100.0	100.0	

Question 7: Do you feel it is important to have your own personal computer?

Importance of PC					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4.00	6	3.0	3.0	3.0
	5.00	11	5.5	5.5	8.5
	6.00	21	10.5	10.5	19.0
	7.00	162	81.0	81.0	100.0
	Total	200	100.0	100.0	

Questions 8: Notebooks are available from many different sources, with many features, at several prices. Considering the features that you want, about how much will that computer cost?

PRICE				
	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	50.00	1	.5	.5	.5
	100.00	3	1.5	1.5	2.0
	200.00	6	3.0	3.0	5.0
	400.00	2	1.0	1.0	6.0
	500.00	6	3.0	3.0	9.0
	600.00	3	1.5	1.5	10.5
	700.00	2	1.0	1.0	11.5
	800.00	3	1.5	1.5	13.0
	900.00	7	3.5	3.5	16.5
	999.00	1	.5	.5	17.0
	1000.00	20	10.0	10.0	27.0
	1099.00	1	.5	.5	27.5
	1100.00	2	1.0	1.0	28.5
	1200.00	18	9.0	9.0	37.5
	1300.00	8	4.0	4.0	41.5
	1400.00	7	3.5	3.5	45.0
	1500.00	32	16.0	16.0	61.0
	1599.00	1	.5	.5	61.5
	1600.00	2	1.0	1.0	62.5
	1700.00	7	3.5	3.5	66.0
	1800.00	3	1.5	1.5	67.5
	1900.00	2	1.0	1.0	68.5
	2000.00	39	19.5	19.5	88.0
	2200.00	1	.5	.5	88.5
	2400.00	2	1.0	1.0	89.5
	2500.00	10	5.0	5.0	94.5
	2800.00	1	.5	.5	95.0
	3000.00	8	4.0	4.0	99.0
	3500.00	1	.5	.5	99.5
	7000.00	1	.5	.5	100.0
	Total	200	100.0	100.0	

Question 9: Considering the computer you envisioned above, about what monthly payment would you expect to make?

MONTHLY					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	9	4.5	4.5	4.5
	6.00	1	.5	.5	5.0
	8.00	1	.5	.5	5.5
	10.00	6	3.0	3.0	8.5
	15.00	3	1.5	1.5	10.1
	20.00	9	4.5	4.5	14.6
	25.00	10	5.0	5.0	19.6
	30.00	12	6.0	6.0	25.6



	35.00	4	2.0	2.0	27.6
	40.00	4	2.0	2.0	29.6
	45.00	2	1.0	1.0	30.7
	50.00	46	23.0	23.1	53.8
	60.00	5	2.5	2.5	56.3
	70.00	4	2.0	2.0	58.3
	75.00	4	2.0	2.0	60.3
	80.00	3	1.5	1.5	61.8
	100.00	45	22.5	22.6	84.4
	125.00	1	.5	.5	84.9
	150.00	14	7.0	7.0	92.0
	200.00	10	5.0	5.0	97.0
	300.00	4	2.0	2.0	99.0
	500.00	1	.5	.5	99.5
	750.00	1	.5	.5	100.0
	Total	199	99.5	100.0	
Missing	System	1	.5		
Total		200	100.0		

Question 10: Would you be interested in applying for financial aid funding towards the purchase of a notebook computer?

Financial Aid Funding					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	41	20.5	20.5	20.5
	2.00	5	2.5	2.5	23.0
	3.00	6	3.0	3.0	26.0
	4.00	19	9.5	9.5	35.5
	5.00	17	8.5	8.5	44.0
	6.00	7	3.5	3.5	47.5
	7.00	105	52.5	52.5	100.0
	Total	200	100.0	100.0	

Question 11: Assuming that the college provides a variety of payment options, do you feel it is reasonable to require all business students to have a notebook computer?

Laptop Requirement					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	26	13.0	13.0	13.0
	2.00	12	6.0	6.0	19.0
	3.00	23	11.5	11.5	30.5
	4.00	24	12.0	12.0	42.5
	5.00	24	12.0	12.0	54.5
	6.00	27	13.5	13.5	68.0
	7.00	64	32.0	32.0	100.0
	Total	200	100.0	100.0	

### Results with respects to relationships

ANOVA was used to determine if there were any significant relationships between variables. All the relationships at .10 or greater are presented below.

Frequency that student checks their e-mails:

- Students that frequently check their emails were more likely to feel that it is important to have their own computers. (sig.= .03)
- Students that frequently check their e-mails are not as price sensitive to laptops as students that don't check their e-mails as frequent. (sig.=.061)
- Students that check their e-mails frequently are more favorable towards having a laptop requirement. (sig.=.001)

Types of computers students own:

Majors:

- Students that own laptops are more favorable towards having a laptop requirement. (sig.=.058)

- EBZ and MHR students are more likely to feel that it is important to have their own computers. (sig.=.071)
- EBZ and Marketing students are more favorable of having a laptop requirement. (sig.=.000)
- EBZ students are more likely to check their e-mails than other four majors. (sig.=.018)

Gender:

- Females are more likely to pay higher monthly payments on their laptops. (sig.=.026)
- Males are more favorable toward having a laptop requirement. (sig.= .075)

Income:

- Females are more likely to check their e-mails more frequent than do males. (sig.=.073)
- Students that have higher incomes are more likely to consider personal computers to be important. (sig.=.048)

### Conclusion

The conclusion supports the hypothesis of E-business students being more favorable towards having a laptop requirement. We can infer that E-business students are different in some ways, and one those ways are, they are more likely to support and accept the laptop requirement. E-Business students are more likely to appreciate and support a laptop requirement. E-business students see the need for laptops in their education, and in the event of a laptop requirement, E-business students will be more willing to support this initiative.

## **Exhibit 3 Minimum Requirements**

### Laptop Requirements

Hardware Standards:

In order for students to complete their degree programs successfully, on-going use of a computer is required. The specifications listed as *baseline* are the minimum standards that all notebook computers should meet.

Students are encouraged to upgrade or purchase a notebook computer to meet or exceed the *recommended* specifications. The principle behind the recommended specifications is that these laptops will be usable for three years from the date of purchase.

### **Baseline (Minimum)/ Recommended Laptop Requirements:**

	<b>Baseline</b>	<b>Recommended</b>
<b><u>CPU</u></b>	Pentium III, 1.1 GHz Processor (Celeron/ AMD is ok)	Pentium 4, 1.6 GHz Processor or higher, (AMD is ok)
<b><u>Memory</u></b>	128MB SDRAM	256MB SDRAM
<b><u>Screen</u></b>	14.1" Viewable, capable resolution 1024x768 or higher	14.1" Viewable, capable resolution 1024x768 or higher
<b><u>Hard Drive</u></b>	20 Gig HD	30 Gig HD

<b>Modem</b>	Integrated 56k Fax/Modem v.92	Integrated 56k Fax/Modem v.92
<b>Network Card</b>	Integrated 10/100 NIC	Wireless PCMCIA card (CISCO Aironet 350) available at bookstore \$120 (optional)
<b>Multimedia</b>	32MB DDR nVidia GeForce4 AGP 4X Graphics  Integrated CD-ROM Drive  Integrated Sound Card	64MB DDR nVidia GeForce4 AGP 4X Graphics  Integrated DVD - CD-RW Combo Drive  Integrated Sound Card
<b>Software</b>	Windows 98/ME, NT, 2000, XP  Microsoft Office 2000, XP (standard)  Option of no software	Windows 98/ME, NT, 2000, XP  Microsoft Office 2000, XP (Pro)  Option of no software
<b>Other Misc. Items</b>	Built-in floppy drive  Lithium Ion-Battery  2 USB Ports, 1 Serial Video output  Carrying case  Weights 8lbs or less  Warranty Plan (1 year std)	Built-in floppy drive  Lithium Ion-Battery  2 USB Ports, 1 Serial Video output  Carrying case  Weights 8lbs or less  Warranty Plan (3 year optional)

### ***Exhibit 4 Indiana University, New Computer Hardware Recommendations***

<http://computerguide.indiana.edu/buying/index.html>

In order to use all the technology services available at IU, we suggest the following minimum hardware components if you are purchasing a new computer.

<u>Minimum PC Requirements</u>		<u>Minimum Mac Requirements</u>	
Processor:	1.2GHz or higher	Processor:	500MHz PowerPC G3
Memory (RAM):	256 MB SDRAM	Memory (RAM):	128 MB SDRAM
Hard Drive:	20 GB Ultra ATA hard drive	Hard Drive:	20 GB Ultra ATA hard drive
Video Card:	Direct-X compatible video card with 32 MB Video RAM	Video Card:	Not Applicable
Sound Card:	SoundBlaster compatible sound capability with two speakers	Sound Card:	Not Applicable
CD-ROM:	48x DVD/CD-ROM drive (or 16x CD-R/W)	CD-ROM:	48x DVD/CD-ROM drive (or 16x CD-R/W)
Removable Storage Media:	Internal Floppy, Internal Zip250 Zip Drive	Removable Storage Media:	Internal Floppy, Internal Zip250 Zip Drive
Ports:	2 USB ports	Ports:	2 USB & Fire Wire ports
Operating System:	Windows XP Professional	Operating System:	Mac OS 9.2.2 or OS X (Requires 128 MB RAM)

## Exhibit 5 Indiana University Negotiated Computer deals

<http://computerguide.indiana.edu/index.html>

Laptop Sample from Dell: Dell latitude C610 (Laptop)

Price \$ 1632.00

S&H \$35.00

Total: \$1667.00

IU Students, faculty, and staff can order Dell systems online, or by phone at 1-888-987-3355. When ordering by phone, don't forget that you must identify yourself as being affiliated with Indiana University.

Component	Description	Dell SKU
Base Unit:	Pentium III, 1.0Ghz, 14.1" XGA Display, NIC	220-9503
Memory:	256MB SDRAM, 1 DIMM	311-2034
Video Card:	ATI Mobility RADEON 16MB DDR SDRAM	
Floppy Drive:	3.5" 1.44MB Floppy Drive	
Hard Drive:	20GB Hard Drive, 9.5 MM	340-7943
Operating System:	Windows 2000, Service Pack 2	420-2315
Network Card:	Internal True mobile 1150 Mini-PCI Wireless Network Card	430-0902
Modem:	Internal 56K V.92 Modem	313-5205
CD-ROM:	24X CD-ROM, Internal/External	313-0249
Speakers:	Integrated stereo speakers	
Service:	Type 3 Contract - Next Business Day Parts & Labor On-Site Response Initial Year	900-6550
Service:	Type 3 Contract - Next Business Day Parts & Labor On-Site Response 2YR Extended	900-6232

## Exhibit 6 University of Florida, Sample computer configurations for University

<http://www.circa.ufl.edu/computers/>

For students acquiring a computer in spring through fall 2002, the following are recommended minimum configurations. These minimum specifications are not necessarily available in new computer configurations currently on the market and are provided as a reference for a *minimally* configured computer. Some colleges have specific requirements more restrictive than the general campus recommendation; see the [college requirements](#) section below for more details.

- 300 MHz or faster CPU (e.g., Intel Pentium/Celeron family, AMD K6/Athlon/Duron family, or compatible processor)
- 64MB or more RAM for Windows 98, NT, or Me operating systems, 128MB or more for Windows 2000, and 256MB or more for Windows XP operating systems is recommended. For other operating systems and software applications, check the minimum requirements of the operating system and application software you will be using for the necessary RAM for your needs.
- 4 GB or larger hard drive
- 10x or faster CD-ROM drive
- High-resolution graphics adapter with at least 2 MB video RAM, supporting at least 24-bit color at 800 X 600 resolution. Laptops should have an external monitor port for connection to an external monitor or classroom projection system.
- High-resolution color display (at least 800 X 600 resolution, 24-bit color. Laptop displays should be at least 12" diagonally, and use active-matrix technology. Desktop displays should be at least 15" diagonally.)
- Sound support, including speakers or headphones
- 56kbps V.90 modem (avoid any modem labeled "win modem" or "modem for Windows")
- Laptops should have PCMCIA or PC-Card slots
- A high-quality printer (ink-jet or laser) is recommended, although limited printing facilities are available in campus labs.
- Bundled software should include either Corel or Microsoft office suite.<sup>1</sup>

<sup>1</sup>The office application suites come in several varieties and combinations of programs. You should evaluate your choice of office productivity suite based on the needs of your intended coursework. Word processing and spreadsheet applications are used in almost all disciplines. Presentation applications are highly recommended since they are used in many courses and many fields. Database applications may be needed in some disciplines. Remember that you can always add the missing applications later, if you discover an unforeseen need.

## **EXHIBIT 7 University of Florida, Warrington College of Business Computer Requirement for Masters and Undergraduate Students**

<http://www.cba.ufl.edu/programs/computer.asp>

Junior / Senior / Masters (Enrolling Summer 2002 through Spring 2003)

If you do not own a notebook computer meeting the following standards, upgrade or buy a notebook computer to meet or exceed the following minimum standards:

### Hardware Specs:

- 500 MHz processor
- 10 gigabyte hard drive
- 256 megabytes or more of RAM
- 10X CD ROM with sound support including speakers and/or headphones
- Lithium Ion battery
- A 10/100 Network adapter (for Ethernet and/or cable modem access)
- 56Kbps V.90 Modem (for dial-up access)

### Software Specs:

- Windows 2000 **OR** XP - **Professional Edition** (Millennium Edition and XP Home Edition is not recommended nor supported.) Compare the features - <http://www.microsoft.com/windows/>
- Microsoft Office 2000 **OR** XP **Professional with Access**. Microsoft Office 2000 Small Business Edition (SBE) bundled with many computers is not adequate. It lacks PowerPoint and Access. Microsoft Office **Premium Edition** is an acceptable and superior alternative as it includes all the features of Professional plus FrontPage and PhotoDraw - <http://www.microsoft.com/office/>
- Microsoft Internet Explorer - <http://www.microsoft.com/windows/ie/>
- Microsoft Outlook Express - <http://www.microsoft.com/windows/oe/>