

ITAC

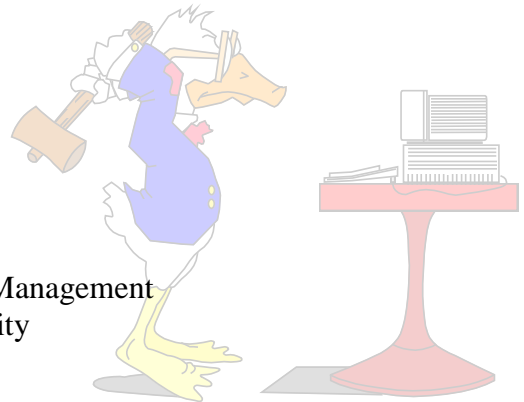
“INFORMATION TECHNOLOGY ACROSS THE CURRICULUM”



A Report by the ITAC Committee:

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SUMMARY

The Information Age is upon us. What is the School of Forestry doing to prepare our students for the 21st century? Do we want to be a leader in the use of Information Technology in classroom? If so, at what level (University, Region)?

The following report is the result of two *all-day* meetings where we defined Information Technology (IT) and discussed the relevance of IT in the School of Forestry. Specific topics included the minimum (and ideal) IT skill levels needed by graduating Seniors, the level of IT currently incorporated in the School of Forestry Programs, the suggested courses where IT could be increased, and the resources needed to increase the level of IT in the School. Conclusions/suggestions included: 1) IT is important to the students and curriculum in the School of Forestry; 2) IT skills are necessary for the current job market; 3) IT should be introduced at every level in the core (required) Forestry (FOR) and Parks and Recreation Management (PRM) courses; 4) IT should parallel the "Writing Across the Curriculum" concept; and finally, 5) A financial commitment of approximately \$53K-73K per year or more for equipment costs is needed to implement and maintain this idea (two years will be approximately \$82K and \$113K, respectively).

OUTLINE

- I. The Basic Questions
- II. Information Technology Defined
- III. Suggested Skills and Knowledge Levels
- IV. Information Technology Across the Curriculum (ITAC) Concept
 - a. Current Uses
 - b. Suggested Uses
- V. Additional Resources Needed
- VI. Emphasis Area in IT or Spatial Analysis
- VII. Relationship with Geography
- VIII. Conference on University Education in Natural Resources
- IX. List of Appendices

I. The Basic Questions:

- 1.) What is Information Technology (or IT)?
- 2.) What is the minimum IT skill level for the Undergraduate (UG) student? The graduating Senior? What is the ideal? Forestry (FOR) majors? Parks and Recreation Management (PRM) majors?
- 3.) Where does the School of Forestry (SOF) currently incorporate IT in the Undergraduate (UG) and Graduate (G) Programs? FOR? PRM? Does the School of Forestry (SOF) want to do more? If yes, then what opportunities do we have to incorporate IT into all of the **CORE** FOR and PRM courses-- the “Information Technology Across the Curriculum” concept (also see “Computing across the Curriculum”¹)?
- 4.) What additional resources (equipment, personnel, space, etc.) do we need to implement “Information Technology Across the Curriculum”?
- 5.) Should we create an emphasis area in IT? What would be some of the required courses? Experiences, etc?
- 6.) Relationships with Geography and Public Planning in this area?

II. Information Technology (IT) Defined:

Information Technology (IT) as defined by our committee is computer-related lab and field hardware/software and skills associated with the following: Basic computer operation and maintenance (hardware and files, etc.), networks (and FTP), operating systems (but basically WINDOWS), Internet (& WWW), email, word processing, spreadsheets, databases (DBMS), presentation software (e.g., Powerpoint), statistical packages; *AND* more specialized field and spatial analysis equipment, software, and tools, such as: field computers (data loggers), global positioning systems (GPS), aerial photos (and interpretation API), remote sensing (together API and satellite imagery/analysis, etc. = remote sensing), laser survey systems, geographical information systems (GIS – specifically ARC/View and ARC/Info; ARC/View is a “front-end” and more user friendly part of ARC/Info), and decision support systems (DSS).

III. Suggested Skills and Knowledge Levels for the Graduating Senior:

¹ Term coined and described by CESM School of Forestry Computing and Scientific Support Group (S. Andariese, T. Bohn, D. Huffman, and B. Weaver) in 1997. See also, “Five Year Strategic Plan” by Computing and Scientific Support Group, School of Forestry, College of Ecosystem Science and Management. February 14, 1997. Pages 2 & 3.

A list of suggested IT Skills and Knowledge Level(s) for the **Graduating Senior** in the School of Forestry are listed in Table 1. The knowledge level will vary with program (FOR and PRM) and year (Fr., Soph, etc.; see also Table 2).

TABLE 1. Suggested Skills/Knowledge Levels for **the Graduating Senior** in the SOF.

SKILL	FOR¹	PRM^{1,2}
GENERAL		
Computer Operation & Maintenance	M	M
Operating Systems (esp. WINDOWS, etc.)	M/H	M
Network (NT, FTP, etc.)	M	M
Internet & WWW	M/H	M
Electronic Mail (email)	M/H	M
Word Processing	M/H	M
Spreadsheets (Excel, etc.)	M/H	M
Databases and DBMS	M/H	M*
Presentation Software (scan/enter graphics, Powerpoint, Photoshop)	M	M
Statistical Packages - Stats in Excel, etc. - STA 270 SAS/JMP	M M	M (SPSS-PC) M
SPECIFIC field/modeling		
Aerial Photos (& API)	M	M*
Data Loggers	M	L*
Global Positioning (GPS)	M	M
Laser Survey Systems	M	L*
ARC/View	M	M*
ARC/Info	L	L*
Decision Support Systems	M	M*
Modeling (simulation, etc.)	M	M*
Digital Imagery/Analysis	L	L*

¹ FOR and PRM knowledge levels: **L = Low** (introduced to the topic; “show and tell”, “Gee-wiz”)

M = Medium (some “hands on” experience; a working knowledge)

H = High (proficient; knowledge and experience; problem solving)

² PRM – * Items are not currently implemented in PRM curriculum; some faculty thought they might not be applicable in PRM core courses.

IV. “Information Technology Across the Curriculum Concept”:

The “IT Across the Curriculum” concept will attempt to parallel the “Writing Across the Curriculum” format. “Writing Across the Curriculum” addresses the need to build

skills/knowledge as the student progresses in the program. “IT Across the Curriculum” will attempt to integrate IT by introducing topics (*Low Level*) such as GPS, ArcView, and Satellite Imaging at the Freshman level with slide shows or exercises, and build on these skills throughout the FOR and PRM programs. “IT Across the Curriculum” further attempts to strengthen the student’s basic computer skills by making extensive use of word processing, spreadsheets, database, internet, and email in assignments throughout the curriculum.

Table 2 lists the CURRENT and SUGGESTED uses of IT in the curriculum. We include only one graduate (G) course that all SoF graduate students must take (FOR 692 - Proseminar I).

TABLE 2. Current and suggested uses of IT in the School of Forestry curriculum.

COURSE ¹	CURRENT	SUGGESTED SKILLS	SUGGESTED KNOWLEDGE	EXAMPLES
UC 101 ^{1,2}	Computer account, email, electronic reserves, web searches			
CIS 120 ²	See syllabus for specifics, but course design is apparently targeted toward satisfying suggested skills For more details, refer to: www.cba.nau.edu/amer-b/CIS120/120syllabus.htm	Computer Operation and Maintenance Operating Systems Word Processing Spreadsheets DataBase	L L/M L/M L/M L//M	Intro to general file management skills Intro to Windows Intro to Word Intro to Excel Intro to Access
FOR101	Some internet and email Some topics, such as data logging, GPS, laser survey systems introduced by way of lecture.	Computer Operation and Maintenance Operating Systems Word Processing Internet and WWW Email Network Global Positioning Laser Survey Systems GIS (ArcView) Aerial Photos (& API) Satellite Imagery	L M M M L L L L L L	General file management skills General Windows MicroSoft Word Web Enhanced course Email communication Demonstrations utilizing LAN access Set of slides for technology stuff “Gee-Wiz” demos of the technology (in class and field)
FOR211	Wordprocessing Computer Operation 1 Lab on Aerial Photo Measurements Demos on GPS	Computer Operation and Maintenance Operating Systems Word Processing Email	M M M M	General file management skills General Windows use MicroSoft Word Email communication

COURSE ¹	CURRENT	SUGGESTED SKILLS	SUGGESTED KNOWLEDGE	EXAMPLES
	Traverse PC (program for traversing) Spreadsheets Database Email Internet/WWW Laser demo	Internet/WWW DataBase Spreadsheets Laser Survey Systems API Satellite Imagery/Analysis	M M L L L	Use of Excel for data tabling/stats More “Gee-Wiz” demos of the technology
		Data Loggers Global Positioning API	M M M	“Hands-On” use of data loggers, topo maps and survey techniques
FOR212	Wordprocessing WWW - Web Enhanced	Computer Operation and Maintenance Operating Systems Word Processing Internet and WWW Email Network	M M M M M M	General file management skills General Windows use MicroSoft Word Web Enhanced course Email communication File storage using LAN access
FOR311	Wordprocessing Spreadsheets (Excel) Stats (Excel) WWW - Web Enhanced	Computer Operation and Maintenance Operating Systems Word Processing Spreadsheets Internet and WWW Email	M M M M M M	General file management skills General Windows use MicroSoft Word Excel Web Enhanced course Email communication of assignments
		Network	M	File storage using LAN access
		Modeling	M	Class lecture/lab
		Satellite Imagery/Analysis GIS (ArcView)	L L	More “Gee-Wiz” demos of technology (eventual lab ex.)
		Data Loggers Global Positioning API	M M M	Increase “Hands-On” use started in FOR211
FOR312	Wordprocessing Spreadsheets	Computer Operation and Maintenance Operating Systems Word Processing	M M M	General file management skills General Windows use MicroSoft Word

COURSE ¹	CURRENT	SUGGESTED SKILLS	SUGGESTED KNOWLEDGE	EXAMPLES
		Internet and WWW	M	Web Enhanced course & Info searches
		Email	M	Email
		Network	M	communication File storage (LAN)
		Presentation Software & Graphics	M	Projects using scanners, Photoshop, and Powerpoint
		Database	L	
		GIS	L	Demos of DBMS/GIS for spatial modeling (Forest-Level Planning, Wildlife Habitat, etc.)
		Spreadsheets	M	G & Y for mgt. assignments
		Modeling	M	Snag/Recruitment Visual Forest
FOR421	Wordprocessing Decision Support Systems	Computer Operation and Maintenance	M	General file management skills
Note: Will begin two semesters in Fall 2001		Operating Systems	M	General Windows use
		Word Processing	M	MicroSoft Word
		Spreadsheets	M	Excel
		Presentation Software & Graphics	M	Photoshop & PowerPoint
		Internet and WWW	M	Web Enhanced course - Info searches
		Email	M	Email communication
		Network		File storage (LAN)
		API	M	Stand typing
		Data Loggers	M	Field inventory, data collection
		GPS	M	
		Laser Survey Systems	M	Full utilization of all of these techniques to complete course requirements
		GIS (ArcView)	M	
		Decision Support Systems (DSS)	M	
		GIS (ArcInfo)	L	“Gee-Wiz” demo of use of ArcInfo as an analytical tool.
FOR692 (Grad class)	Wordprocessing Presentation Software and Graphics Computer Operation	Computer Operation and Maintenance	M	General file management skills
		Operating Systems	M	General Windows use
		Word Processing	M/H	MicroSoft Word

COURSE ¹	CURRENT	SUGGESTED SKILLS	SUGGESTED KNOWLEDGE	EXAMPLES
	Computer Operating Systems	Presentation Software / Graphics Internet and WWW Email Network	M/H M M M	Photoshop & PowerPoint Web Enhanced course Email communication File storage (LAN)
PRM220	Word Processing WWW-Web-enhanced Virtual conference center	Email PC operation Word Processing	M M M	
PRM252	Word Processing Email	Same as Current	M M	
PRM275	Class registration program WWW-Web-enhanced Virtual conference center	Activity registration Email Word Processing	M M M	
PRM301	N/A: new class	Computer Operation and Maintenance Operating Systems Word Processing Spreadsheet Internet and WWW Email Network	M M M M M M M	
PRM308	WWW-Web-enhanced Email	Same	M M	
PRM326	Email WWW-Web-enhanced Word Processing LDB software	Same	M M M M	Leisure Diagnostic Battery Software
PRM346		Computer Operation and Maintenance Operating Systems Word Processing Spreadsheet	M M M M	MS word Excel

COURSE ¹	CURRENT	SUGGESTED SKILLS	SUGGESTED KNOWLEDGE	EXAMPLES
		Internet and WWW, Email, Network Simulation software	M	Web-enhanced class Windows environment ROS planning/mgt simulation (software in development stage)
PRM360	Web page construction Word Processing Power point Email		M M M M	Power Point Graphics Digital Image capture and transmission
PRM383	Email WWW-Web-enhanced Word Processing Spread Sheet (Quicken) Virtual Conference Center		M M M M M	
PRM408	Email		M	
PRM426	Email WWW-Web-enhanced Spread Sheet (Quicken) Word Processing Virtual Conference Center		M M M M M	
PRM447	Web information retrieval	SPSS-PC, Stats Software working Knowledge	M	
PRM498 Senior Seminar				
PRM331 /431	Map/cover	Navigation Location (GPS)	M	Checking Field Locations

¹ Course numbers and titles are listed in Appendix A.

² UC 101 required by all incoming Freshman beginning Fall, 1999. CIS 120 required by FOR majors. Transfer students may possibly take a combination of CIS 1-credit courses OR a Coconino Community College courses to fulfill the requirement. See Appendix B.

V. Additional Resources Needed (equipment, personnel, space, etc.):

Additional resources (equipment, personnel, space, etc.) are needed to implement ITAC. The proposed schedule for implementation and maintenance of equipment are listed in Table 3. Approximately \$53K-73K per year or more for equipment costs is

needed to implement and maintain this idea (two years will be \$82K and \$113K, respectively). Additional personnel and additional space were not discussed in detail.

VI. Emphasis Area in IT or Spatial Analysis:

Below is a suggested or ideal list of courses/experiences for an Undergraduate Emphasis Area in Information Technology or Spatial Analysis. An interested “set” of faculty will formally submit a request for this emphasis area (**note: please let M. Moore know if you are interested.**). Here are some suggestions.

FORESTRY or PRM PROGRAMS:

To obtain a FOR or PRM degree with an emphasis in IT or Spatial Analysis, you must complete the basic degree requirements, plus the following 12-14 hours (or some combination of courses??):

FOR211	Mapping and Measurements (3)	- req. by FOR majors
GGR230	Map and Image Interpretation (4)	
GGR320	Introduction to Remote Sensing (4)	
GGR331	Analytic and Computer Cartography (3)	
GGR422	Remote Sensing Tech. I (4)	
GGR423	Remote Sensing Tech. II (4)	
GGR424	Remote Sensing Tech. III (2)	
GGR433	Survey of GIS (3)	
GGR582	Quantitative Tech. In Geog (3)	- incl. spatial patterns/stats
PL431	Computer Mapping for Planning (2)	
FOR524	Aerial Photo Interpretation (3)**	
FOR525	Geographic Info. Systems (3)**	- lab uses Arc/Info
STA575	Applied Sampling (3)	
FOR544	Landscape Ecology (3)	- cross-list with ENV544
FOR695	Digital Terrain Models (3)**	- on demand only

** courses will no longer be offered by Moore but by Arundel in Geography, or Parysow in Forestry.

VII. Relationships with Geography and Public Planning (GGR/PP):

(**note: This topic was not addressed at our meetings, but it does need to be discussed. We will need to determine: GGR/PP interest; current courses available; resources (hardware, software; faculty/staff) available; GGR/PP future Plans (including

the *new* Masters-level GIS certificate; Lab space, etc.)). *Suggest that a Geography faculty member be invited to join our ITAC committee and future meetings.*

VIII. Conference on University Education in Natural Resources

CALL FOR PAPERS

Third Biennial Conference on University Education in Natural Resources

University of Missouri, Columbia MO

March 25-28, 2000

This is a third in a series of conferences designed to explore innovations in university and continuing education in natural resources. Abstracts due September 30, 1999**.

(**Suggested topic area for paper or poster: #15 Incorporation of new technologies in courses and curricula.)

IX. LIST OF APPENDICES:

- A. Course Number (#) and Titles listed in report.
- B. List of computer labs available to students and potential classes, etc. where students (especially Transfer Students) may obtain computer training.

APPENDIX A.

Course number (#) and course titles listed in this report.

<u>Course #</u>	<u>Course Title</u>
UC 101	Freshman Colloquium
CIS 120	Introduction to Computer Information Systems
FOR 101	Forestry Introduction
FOR 211	Forest Mapping and Measurements
FOR 212	Trees and Forests of North America (Silvics)
FOR 311	Forest Science A ("Semester A")
FOR 312	Forest Science B ("Semester B")
FOR 421	Forest Science C ("Semester C") (**begins two semesters fall 2001) FOR
692	Proseminar I (only Graduate Course discussed in this report)
PRM 220	Introduction to Parks and Recreation Management
PRM 252	Recreation Leadership and Supervision
PRM 275	Program Planning
PRM 301	Recreation Economics
PRM 308	Practicum in PRM
PRM 326	Adaptive Recreation
PRM 346	Wildland Recreation Management
PRM 360	Interpretation
PRM 383	Community & Commercial Recreation Management
PRM 408	Internship in PRM
PRM 426	Parks and Recreation Administration and Finance
PRM 447	Recreation Program Planning
PRM 331/431	Senior Seminar

APPENDIX B. (compiled by J. Thompson)

List of computer labs available to students and potential classes, etc. where students (especially Transfer Students) may obtain computer training.

Computer Labs Available to CESM Students:

Forestry Bldg Undergraduate Lab:

8:00 a.m. - 6:00 p.m. Monday - Friday (except during class periods)

Forestry Bldg Graduate Lab: (*Grad student preference; can get access codes*)

8:00 a.m. - 6:00 p.m. Monday - Friday

NAU South Lab (Learning Resource Center - Bldg 61)

NAU North Lab (Communication - Bldg 16 - Room 301)

8:00 a.m. - 10:00 p.m.	Monday - Thursday
8:00 a.m. - 8:00 p.m.	Friday
10:00 a.m. - 8:00 p.m.	Saturday
12:00 p.m. - 10:00 p.m.	Sunday

Arts & Science Computer Lab (Physics - Bldg 19 - Room 232) - **TBA**

Computer Training Available to CESM Students:

CIS 120 - Intro to CIS (3 credit hours)

NAU Management Development Center: 1-2 Seminars ranging from \$95 - \$285

Coconino Community College

- CIS 102 - Computer Literacy (2 credit hours)
- CIS 111 - Principles of Programming (1 credit hour)
- CIS 112 - Introduction to Windows (2 credit hours)
- CIS 113 - Introduction to Power Point (1 credit hour) (8 week course)
- CIS 115 - Introduction to the Internet (1 credit hour) (8 week course)
- CIS 117 - Creating Web Pages (1 credit hour) (8 week course)
- CIS 122 - Introduction to MS Word (2 credit hours)
- CIS 123 - Introduction to MS Excell (2 credit hours)
- CIS 124 - Introduction to Word Perfect (2 credit hours)
- CIS 125 - Introduction to MS Access (3 credit hours)
- CIS 127 - Introduction to Desktop Publishing (3 credit hours)