

# AccessComputing Equal Access: Universal Design of Computing Departments

## A checklist for making computing departments welcoming and accessible to students with disabilities

The group of individuals pursuing computing fields is becoming increasingly diverse with respect to gender, race, ethnicity, learning style, age, disability, and other characteristics. High-tech careers are potentially open to individuals with disabilities because of advancements in assistive technology that provide access to computers. However, the inaccessible design of facilities and software, curriculum, webpages, and distance learning courses continue to erect barriers.

When it comes to a department of computer science, computer engineering, or information technology, the vision is simply equal access. Everyone who qualifies to take courses within your department and anyone who is qualified to teach them should be able to do so.

Universal design can provide an approach for making your department accessible to all potential students and instructors. Universal design is defined by the architect Ron Mace as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.”<sup>1</sup> It suggests that, rather than design your departmental offerings for the average user, design them for people with a broad range of abilities, disabilities, ages, reading levels, learning styles, native languages, cultures, and other characteristics. More information about applications of universal design can be found in *Universal Design: Principles, Process, and Applications*<sup>2</sup>.

In applying universal design, keep in mind that individuals in your department may have learning disabilities or visual, speech, hearing, and mobility impairments. Make sure everyone

- feels welcome,
- can get to facilities and maneuver within them,
- is able to fully benefit from resources and courses, and
- can make use of equipment and software.

Although applying universal design minimizes the need for accommodations for students, faculty, and staff with disabilities, it is also important to have a plan in place to respond to additional accommodation requests in a timely manner and to ensure that faculty and staff are prepared to work with colleagues and students who have disabilities.

The *AccessComputing Alliance* has drafted an *Accessibility Checklist* to guide faculty and administrators in making their computing department more accessible. This content does not provide legal advice. Your disabled student services office may also be able to assist you in increasing the accessibility of your department. Consult your campus legal counsel, campus ADA/504 compliance officer, or regional Office for Civil Rights (OCR) regarding relevant legal issues.

### Planning, Policies, and Evaluation

Consider diversity issues as you plan and evaluate your facilities and programs.

- Are people with disabilities, racial and ethnic minorities, men and women, young and old students, and other groups represented on your staff, faculty, and student body?
- Are people with disabilities, racial and ethnic minorities, men and women,



young and old students, and other groups included in departmental planning and review processes and advisory committees?

- Do you have policies and procedures that ensure access to facilities, printed materials, computers, and electronic resources for people with disabilities?
- Do policies and procedures require that accessibility be considered in the procurement process for software and other information technology? (See, for example, the Section 508 Standards for Electronic and Information Technology).<sup>3</sup>
- Do policies and procedures require that accessibility be considered when departmental software is created?
- Do you have a procedure to ensure a timely response to requests for disability-related accommodations? Is this content included in faculty and staff orientations and periodically in other meetings?
- Are disability-related access issues addressed in any external or internal evaluations that are done of your courses or services?

## Facility and Environment

Ensure physical access, comfort, and safety within an environment that is welcoming to visitors with a variety of abilities, racial and ethnic backgrounds, genders, and ages.

- Are there parking areas, pathways, and entrances to departmental buildings wheelchair-accessible?
- Are all levels of departmental facilities connected via wheelchair-accessible routes of travel? Are accessible routes of travel easy to find?
- Are there ample high-contrast, large-print directional signs to and throughout departmental labs, administrative offices, classrooms, and other facilities? Is Braille

signage available when appropriate?

- Do elevators have both auditory and visual signals for floors?
- Are elevator controls accessible from a seated position and available in large print and Braille or raised notation?
- Are universally-recognized icons used on signage?
- Are wheelchair-accessible restrooms with well-marked signs available?
- Are parts of counters and desks in student service areas at a height accessible from a seated position?
- Are aisles kept wide and clear of obstructions for the safety of users who have mobility or visual impairments?
- Is adequate light available?
- Are there quiet work or meeting areas where noise and other distractions are minimized?
- Can at least one public telephone in the department be reached from a seated position?

Consult the ADA Checklist for Readily Achievable Barrier Removal<sup>4</sup> for more suggestions.

## Support Services

Make sure support staff are prepared to work with all students, faculty, and staff.

- Do staff members know how to respond to requests for disability-related accommodations such as sign language interpreters?
- Are staff members familiar with the availability and use of Telecommunications Relay Services, assistive technology, and alternate document formats?
- Are staff members aware of issues related to communicating with students



of different races, ethnicities, ages, and students who have disabilities? See the Communication Hints at the end of this publication.

- Is the departmental Webmaster knowledgeable about accessible web design?

Consult *Equal Access: Universal Design of Student Services*<sup>5</sup> for more suggestions for making services accessible to all students.

### Information Resources

Ensure that departmental publications and websites welcome a diverse group and that information is accessible to everyone.

- Are accessibility issues incorporated into mainstream web design and other technology training for students and staff?
- Do pictures in departmental publications and on websites include people with diverse characteristics with respect to race, gender, age, and disability?
- In key publications, does the department include a statement about its commitment to universal access and procedures for requesting disability-related accommodations? For example, you could include the following statement: “The Computer Science Department values diversity and strives to make courses, information resources, and services accessible to all potential students and visitors. Please inform faculty and staff of accessibility barriers you encounter and request accommodations that will make courses, services, and information resources accessible to you.” Ideally use the institution’s diversity statement.
- Are key documents provided in a language(s) other than English?
- Are all printed publications available in an accessible format on the department’s

website and also available (immediately or in a timely manner) in alternate formats such as Braille, large print, and electronic text?

- Do departmental webpages adhere to accessibility guidelines or standards adopted by your institution or your department? Section 508 Standards for Accessible Electronic and Information Technology<sup>3</sup> and the W3C’s Web Content Accessibility Guidelines<sup>6</sup> are most commonly used. For information about designing accessible websites, consult the *World Wide Access: Accessible Web Design* video and publication.<sup>7</sup>



### Computing Courses and Faculty

Ensure that faculty members deliver courses that are accessible to all students and that accommodations are provided in a timely manner.

- Do video presentations used in courses have captions? Audio descriptions? Do podcasts have transcripts?
- Do faculty members know how to respond to requests for disability-related accommodations such as sign language interpreters?
- Are faculty members aware of issues related to communicating with students of different races, ethnicities, and ages and students who have disabilities? (See the Communication Hints at the end of this publication.)



- Do faculty members employ accessible web design practices for their websites?
- Are faculty members familiar with and do they employ instructional strategies that maximize the learning of all students? (See *Equal Access: Universal Design of Instruction*<sup>8</sup> for a checklist of instructional strategies.)
- Do administrators and instructors promote the use of flexible methods of assessment for students with diverse abilities and learning styles?
- Is universal and accessible design incorporated into the curriculum of appropriate courses (e.g., requiring software designed by students be accessible to people with disabilities)?
- Is a wrist rest and forearm rest available for those who require extra support while typing?
- Can controls on computers, printers, scanners, and other information technology be reached from a seated position (e.g., easy access to power switches on computers and surge protectors)?
- Are adequate work areas available for both right- and left-handed users?

For more information about making a computer lab accessible, consult *Equal Access: Computer Labs*.<sup>9</sup> For information about assistive technology, consult DO-IT's technology and universal design videos and publications.<sup>10</sup>



## Computers, Software, and Assistive Technology

Make technology in computing facilities accessible to everyone. Begin with a few items and add more later.

- Is an adjustable-height table available for each type of computer workstation?
- Is screen enlargement software available for users with low vision? Is a large monitor available so that a larger amount of screen can be viewed while magnified?
- Is text-to-speech software available to those with print-related disabilities?
- Is a trackball available for those who have difficulty controlling a mouse?

## Checklist Updates

This checklist was adapted with permission from the checklists within the publications *Equal Access: Universal Design of Computer Labs*<sup>11</sup> and *Equal Access: Universal Design of Student Services*<sup>5</sup> (author S. Burgstahler). All of these checklists are being refined and field tested at postsecondary institutions nationwide. To increase the usefulness of the checklist for computing departments included in this publication, send suggestions to [sherylb@u.washington.edu](mailto:sherylb@u.washington.edu).

## Cited Web Resources

1. [http://www.design.ncsu.edu/cud/about\\_ud/about\\_ud.htm](http://www.design.ncsu.edu/cud/about_ud/about_ud.htm)
2. <http://www.washington.edu/doit/Resources/udesign.html>
3. <http://www.access-board.gov/sec508/guide/>
4. <http://www.usdoj.gov/crt/ada/checkweb.htm>
5. [http://www.washington.edu/doit/Brochures/Academics/equal\\_access\\_ss.html](http://www.washington.edu/doit/Brochures/Academics/equal_access_ss.html)
6. <http://www.w3.org/TR/WCAG20/>
7. <http://www.washington.edu/doit/Video/www.html>



8. [http://www.washington.edu/doi/Brochures/Academics/equal\\_access\\_udi.html](http://www.washington.edu/doi/Brochures/Academics/equal_access_udi.html)
9. <http://www.washington.edu/doi/Video/equal.html>
10. <http://www.washington.edu/doi/Resources/technology.html>
11. <http://www.washington.edu/doi/Brochures/Technology/comp.access.html>



### About AccessComputing

The Department of Computer Science and Engineering and DO-IT (Disabilities, Opportunities, Internetworking and Technology) at the University of Washington lead the *AccessComputing* Project for the purpose of increasing the participation of people with disabilities in computing careers nationwide. *AccessComputing* partners include Gallaudet University, Landmark College, Rochester Institute of Technology, Microsoft, the NSF Regional Alliances for Persons with Disabilities in STEM. Collaborators represent education, industry, government, and professional organizations nationwide.

*AccessComputing* is supported by the National Science Foundation under Grant No. CNS-0540615 and CNS-0837508). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

For further information, to be placed on the mailing list, or to request materials in an alternate format, contact:

University of Washington  
 Box 354842  
 Seattle, WA 98195-4842  
[accesscomp@u.washington.edu](mailto:accesscomp@u.washington.edu)

[www.washington.edu/accesscomputing/](http://www.washington.edu/accesscomputing/)  
 206-221-4171 (Fax)  
 206-685-DOIT (3648) (voice / TTY)  
 888-972-DOIT (3648) (toll free voice / TTY)  
 509-328-9331 (voice / TTY) Spokane

Dr. Richard Ladner, PI  
 Dr. Sheryl Burgstahler, Co-PI  
 Michael Richardson, Project Manager

Copyright © 2009, 2008, 2007, 2006, University of Washington. Permission is granted to copy these materials for educational, noncommercial purposes provided the source is acknowledged.

The content of this document was adapted with permission from the publications *Equal Access: Universal Design of Computer Labs* and *Equal Access: Universal Design of Student Services*<sup>10</sup>.

Grants and gifts fund DO-IT publications, videos, and programs to support the academic and career success of people with disabilities. Contribute today by sending a check to DO-IT, Box 354842, University of Washington, Seattle, WA 98195-4842.

Your gift is tax deductible as specified in IRS regulations. Pursuant to RCW 19.09, the University of Washington is registered as a charitable organization with the Secretary of State, State of Washington. For more information call the Office of the Secretary of State, 800-322-4483.



**DO-IT**

**University of Washington**  
 Computer Science and Engineering  
 DO-IT  
 UW Technology Services

## Communication Hints

Treat people with disabilities with the same respect and consideration with which you treat others. There are no strict rules when it comes to relating to people with disabilities. However, here are some helpful hints.

### General

- Ask a person with a disability if he or she needs help before providing assistance.
- Talk directly to the person with a disability, not through the person's companion or interpreter.
- Refer to a person's disability only if it is relevant to the conversation. If so, mention the person first and then the disability. "A man who is blind" is better than "a blind man" because it puts the person first.
- Avoid negative descriptions of a person's disability. For example, "a person who uses a wheelchair" is more appropriate than "a person *confined* to a wheelchair." A wheelchair is not confining—it's liberating!
- Do not interact with a person's guide dog or service dog unless you have received permission to do so.

### Blind or Low Vision

- Be descriptive. Say, "The computer is about three feet to your left," rather than "The computer is over there."
- Speak all of the content presented with overhead projections and other visuals.
- When guiding people with visual impairments, offer them your arm rather than grabbing or pushing them.

### Learning Disabilities

- Offer directions or instructions both orally and in writing. If asked, read instructions to individuals who have specific learning disabilities.

### Mobility Impairments

- Sit or otherwise position yourself at the approximate height of people sitting in wheelchairs when you interact.

### Speech Impairments

- Listen carefully. Repeat what you think you understand and then ask the person with a speech impairment to clarify or repeat the portion that you did not understand.

### Deaf or Hard of Hearing

- Face people with hearing impairments so they can see your lips. Avoid talking while chewing gum or eating.
- Speak clearly at a normal volume. Speak louder only if requested.
- Use paper and pencil if the person who is deaf does not read lips or if more accurate communication is needed.
- In groups raise hands to be recognized so the person who is deaf knows who is speaking. Repeat questions from audience members.
- When using an interpreter, speak directly to the person who is deaf; when an interpreter voices what a person who is deaf signs, look at the person who is deaf, not the interpreter.

### Psychiatric Impairments

- Provide information in clear, calm, respectful tones.
- Allow opportunities for addressing specific questions.