

# Access Computing

## Equal Access: Universal Design of Computing Departments

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

The group of individuals pursuing computing fields is becoming increasingly diverse with respect to gender, race, ethnicity, learning style, age, disability, and other characteristics. Many companies are looking to hire individuals with disabilities into technical roles. However, the inaccessible design of facilities and software, curriculum, web pages, and distance learning courses continue to erect barriers. All qualified students should be welcome to join your department and engage to the fullest extent regardless of disability.

Universal design can provide an approach for making your department accessible to all potential students and instructors. Universal design is “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 disabilities related to learning, vision, speech, hearing, mobility, attention, autism, or mental health. 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.

### Guidelines and Examples

*Access Computing* has drafted an *Accessibility Checklist* to guide faculty and administrators in making their computing department more accessible. Your student disability 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. It is standard to have a statement in all course syllabi welcoming all students with information on how to request accommodations.

- 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?





## Information Resources

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

- Do departmental web pages 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>
- 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 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?
- 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?



## 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 employ accessible web design practices for their websites?
- 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, ages, and abilities? (See the Communication Hints at the end of this publication.)
- 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)?



### 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?
- Are screen readers and text-to-speech software available to those with print-related disabilities?
- 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 a trackball available for those who have difficulty controlling a mouse?
- 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>

### 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> 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@uw.edu](mailto:sherylb@uw.edu).

### Additional Resources

For more information about applications of universal design consult *The Center for Universal Design in Education* website,<sup>12</sup> or the book *Universal Design in Higher Education: From Principles to Practice, Second Edition* published by Harvard Education Press. To learn more or order online, visit the DO-IT website.<sup>13</sup>

### Getting Started

Looking at all of these suggestions may seem overwhelming. The great thing about universal design is it can be applied incrementally. For example, a department might begin by assigning an existing diversity committee or creating a new task force to explore ways of making the department more welcoming and accessible to everyone. Members of the advisory group could, as they go through the checklist provided in this publication, cross off items not applicable in their department, note as "done" those that have already been implemented, and label with a recommended deadline date for those they feel should be addressed by the department. Then, using the online version of this publication, they could order the items by date and add additional notes as appropriate. Presenting the timeline to the department decision-maker on diversity issues could be the next step. Once approval is secured, assigning staff and, when needed, securing budget funds could move the project along.



## Cited Web Resources

1. [projects.ncsu.edu/design/cud/about\\_ud/about\\_ud.htm](http://projects.ncsu.edu/design/cud/about_ud/about_ud.htm)
2. [www.uw.edu/doi/resources/popular-resource-collections/applications-universal-design](http://www.uw.edu/doi/resources/popular-resource-collections/applications-universal-design)
3. [www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards](http://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards)
4. [www.ada.gov/checkweb.htm](http://www.ada.gov/checkweb.htm)
5. [www.uw.edu/doi/equal-access-universal-design-student-services](http://www.uw.edu/doi/equal-access-universal-design-student-services)
6. [www.w3.org/TR/WCAG20/](http://www.w3.org/TR/WCAG20/)
7. [www.uw.edu/doi/videos/index.php?vid=35](http://www.uw.edu/doi/videos/index.php?vid=35)
8. [www.uw.edu/doi/equal-access-universal-design-instruction](http://www.uw.edu/doi/equal-access-universal-design-instruction)
9. [www.uw.edu/doi/videos/index.php?vid=12](http://www.uw.edu/doi/videos/index.php?vid=12)
10. [www.uw.edu/doi/resources/popular-resource-collections/accessible-technology](http://www.uw.edu/doi/resources/popular-resource-collections/accessible-technology)
11. [www.uw.edu/doi/equal-access-universal-design-computer-labs](http://www.uw.edu/doi/equal-access-universal-design-computer-labs)
12. [www.uw.edu/doi/programs/center-universal-design-education/overview](http://www.uw.edu/doi/programs/center-universal-design-education/overview)
13. [www.uw.edu/doi/universal-design-higher-education-principles-practice-1](http://www.uw.edu/doi/universal-design-higher-education-principles-practice-1)
14. [www.uw.edu/accesscomputing/about/partners](http://www.uw.edu/accesscomputing/about/partners)

## About AccessComputing

The Paul G. Allen School of Computer Science & Engineering, the Information School and DO-IT (Disabilities, Opportunities, Internetworking and Technology) at the University of Washington lead *AccessComputing* for the purpose of increasing the participation of people with disabilities in computing careers nationwide. *AccessComputing* partners<sup>14</sup> include over fifty postsecondary institutions, computing organizations, and companies. Collaborators represent education, industry, government, and professional organizations nationwide.

For further information, to be placed on the mailing list, request materials in an alternate format, or to make comments or suggestions about DO-IT publications or web pages, contact:

University of Washington  
Box 354842  
Seattle, WA 98195-4842  
[accesscomp@uw.edu](mailto:accesscomp@uw.edu)  
[www.uw.edu/accesscomputing/](http://www.uw.edu/accesscomputing/)  
206-685-DOIT (3648) (voice / TTY)  
888-972-DOIT (3648) (toll free voice / TTY)  
509-328-9331 (voice / TTY) Spokane  
206-221-4171 (fax)

Richard Ladner, PI  
Sheryl Burgstahler, Co-PI  
Jacob O. Wobbrock, Co-PI  
Andrew Ko, Co-PI  
Brianna Blaser, Program coordinator  
Kayla Brown, Program coordinator

## Acknowledgments

*AccessComputing* is supported by the National Science Foundation under Grant #CNS-0540615, #CNS-0837508, #CNS-1042260, and #CNS-1539179. 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.

Copyright © 2018, 2012, 2011, 2010, 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*<sup>11</sup> and *Equal Access: Universal Design of Student Services*.<sup>5</sup>



Information  
School  
UNIVERSITY of  
WASHINGTON

## Communication Hints

Treat people with disabilities with the same respect and consideration with which you treat others. Here are some helpful hints when it comes to delivering a presentation, hosting an exhibit, and otherwise relating to people with disabilities.

### General

- Ask a person with a disability if that person needs help before providing assistance.
- Talk directly to the person with a disability, not through their companion or interpreter.
- Refer to a person's disability only if it is relevant to the conversation.
- Avoid derogatory slang or 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!
- Provide information in alternate means (e.g., written, spoken, diagrams).
- Do not interact with a person's guide dog or service dog unless you have received permission to do so.
- Do not be afraid to use common terms and phrases, like "see you later" or "let's go for a walk" around people with disabilities.
- Do not touch mobility devices or assistive technology without the owner's consent.
- Do not assume physical contact, like handshakes, high-fives, or hugs are okay.
- Understand that not everyone uses eye contact.

### 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 projected content when presenting and describe the content of charts, graphs, and pictures.
- 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

- Consider carrying on a long conversation with an individual who has a mobility impairment from a seated position.

### 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, and avoid covering your mouth, so they can see your lips. Avoid talking while chewing gum or eating.
- Speak clearly at a normal volume. Speak louder only if requested.
- Repeat questions from audience members.
- Use paper and pencil, or type things out on your cell phone, if the person who is deaf does not read lips or if more accurate communication is needed.
- 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.