IUPUI
SCHOOL OF INFORMATICS AND COMPUTING
Department of Human-Centered Computing

INFO-I 482
Assistive Technology

Fall 2019

Section No.: INFO-I 400 33445 & NEWM-N 485 34441
Credit Hours: 3
Time: online
Location: online
First Class: August 26, 2019
Instructor: M. Wade Wingler, MBA, ATP
Office Hours: by Appointment
Email: mwwingle@iupui.edu

Prerequisites: None

COURSE DESCRIPTION

This course explores the types and uses of assistive technology. Students compare technologies related to vision, hearing, communication, mobility, fine motor, intellectual, and cognitive disabilities. Projects enable students to evaluate the needs of people with disabilities and the community resources, funding sources, and systems available to increase their independence.

EXTENDED COURSE DESCRIPTION

This course explores the various types and uses of assistive technology (AT): products, equipment, and systems that enhance learning, working, and daily living for persons with disabilities. Students compare and contrast specific technology related to vision, hearing, communication, mobility, fine motor, intellectual, and cognitive disabilities. Hands-on and in-depth projects enable students to evaluate the historical, social, technical, and disability-specific needs encountered by people with disabilities, as well as the community resources, funding sources, and systems available to increase their independence. Trends and current research in the field of Assistive Technology will be highlighted. Examples of technologies covered in this course include text-to-speech, magnification, speech-to-text, Braille, video-modeling, home automation, internet of things, augmentative and alternative communication systems, and adaptive gaming. In-depth research and hands-on experience in a particular area of disability and assistive technology will be a required portion of this course.

Required Text(s):

Title: *Assistive Technology for People with Disabilities*
Author(s): Anson, Dennis K.
Edition: 1st
Publisher: ABC-CLIO
ISBN: 978-1440835117

Available at Amazon.com:
https://www.amazon.com/dp/144083511X/ref=cm_sw_em_r_mt_dp_U_Edf.CbPR276FB

Supplemental materials will be used throughout the course and are listed within modules on Canvas.

Learning Outcomes:

Upon completion of this course, the student will	**RBT[1]**	**PLUS[2]**	**PLO[3]**	**Assessment**
1. Summarize and explain various disability categories and related assistive technologies.	2	P1.1	A6	Graded Discussion, Video Presentation, Final Paper
2. Discover new and developing trends in assistive technology.	4	P3.1, P3.4	B4, C4	Graded Discussion
3. Evaluate appropriate technologies to recommend and apply them to meet the needs of individuals with various disabilities.	5	P4.1, P3.2	A6, D2 E1	Graded Discussion, Final Paper
4. Demonstrate the appropriate use and strengths and limitations of disability-specific technologies in a video presentation.	3	P4.3, P4.4	E2, E3	Video Presentation

[1] RBT: Revised Bloom's Taxonomy
[2] PLUS: IUPUI+ Profiles of Learning for Undergraduate Success: https://academicaffairs.iupui.edu/Strategic-Initiatives/IUPUI-Plus
[3] PLO: Program Learning Outcomes

Informatics BS Program Learning Outcomes

Informatics B.S. Program-level Learning Outcomes	Profiles of Learning for Undergraduate Success
A. Foundations of Informatics and Computing	No mark: Major emphasis; *: Minor emphasis; **: Some emphasis
1. Explain the fundamentals of computer hardware and software	P1.4 **Communicator** – Conveys ideas effectively
2. Apply knowledge and skills of logic and discrete mathematics	P2.3 **Problem Solver** – Analyzes, synthesizes, and evaluates
3. Apply the concepts of statistics and probability	P2.3 **Problem Solver** – Analyzes, synthesizes, and evaluates
4. Describe basic data and information representation	P1.4 **Communicator** – Conveys ideas effectively
5. Select appropriate software to manage information technology projects	P2.1 **Problem Solver** – Thinks critically P3.4 **Innovator** – Makes decisions*
6. Evaluate and create interfaces by applying user experience design principles, methods, and theories	P1.1 **Communicator** – Evaluates information P3.2 **Innovator** – Creates/designs*
7. Evaluate approaches to data and information governance, privacy, and security	P4.3 **Community Contributor** – Behaves ethically P4.4 **Community Contributor** – Anticipates consequences*
B. Problem Solving and Critical Thinking	
1. Use problem-solving techniques to design program algorithms, including pseudocode and flowcharts	P2.3 **Problem Solver** – Analyzes, synthesizes, and evaluates P3.2 **Innovator** – Creates/designs*
2. Explain programming concepts of procedural and object-oriented programming	P1.1 **Communicator** – Evaluates information P1.4 **Communicator** – Conveys ideas effectively*
3. Create computer programs in one or more programming languages	P3.2 **Innovator** – Creates/designs P2.4 **Problem Solver** – Perseveres*
4. Develop insights from data and apply them to address problems and explore opportunities	P3.1 **Innovator** – Investigates P3.4 **Innovator** – Makes decisions*
C. Data Studies and Analytics	
1. Apply analytical methods for knowledge and pattern discovery and data analysis	P2.3 **Problem Solver** – Analyzes, synthesizes, and evaluates P3.1 **Innovator** – Investigates*
2. Evaluate various data mining and machine learning algorithms	P2.3 **Problem Solver** – Analyzes, synthesizes, and evaluates
3. Create effective visualizations to analyze and communicate data	P1.4 **Communicator** – Conveys ideas effectively P3.2 **Innovator** – Creates/designs*
4. Communicate insights derived from data	P1.4 **Communicator** – Conveys ideas effectively
D. Design and Analysis of Information Systems	
1. Apply fundamental concepts of software architecture	P2.1 **Problem Solver** – Think critically P2.3 **Problem Solver** – Analyzes, synthesizes, and evaluates*
2. Develop user requirements	P1.1 **Communicator** – Evaluates information P1.2 **Communicator** – Listens actively*

Informatics B.S. Program-level Learning Outcomes	Profiles of Learning for Undergraduate Success
3. Define terms and explain principles essential to the design of IT and computing systems	P1.4 **Communicator** – Conveys ideas effectively
4. Design dynamic, data-driven web applications	P3.2 **Innovator** – Creates/designs
5. Design large, complex multilayered information systems with software design patterns	P3.2 **Innovator** – Creates/designs P2.4 **Problem Solver** – Perseveres*
6. Design web service consumers and producers in service-oriented architectures	P3.2 **Innovator** – Creates/designs P2.1 **Problem Solver** – Thinks critically*
E. **Social Dynamics of Informatics and Information Technology**	
1. Analyze the social, cultural, and organizational settings in which IT solutions will be deployed to achieve successful implementations	P4.1 **Community Contributor** – Builds community P4.2 **Community Contributor** – Respectfully Engages Own and Other Cultures*
2. Interpret major societal trends affecting the development and deployment of technology, such as access, privacy, intellectual property, security, and equity	P4.3 **Community Contributor** – Behave ethically P4.4 **Community Contributor** – Anticipates consequences*
3. Analyze the impact of IT on individuals, groups, and organizations at local and global levels	P3.1 **Innovator** – Investigates P4.2 **Community Contributor** – Respectfully Engages Own and Other Cultures*
4. Articulate the business considerations of technical knowledge	P1.4 **Communicator** – Conveys ideas effectively
F. **Professional Skills and Ethics**	
1. Evaluate social, legal, and ethical issues in informatics by applying ethical principles to resolve conflicts	P4.3 **Community Contributor** – Behave ethically P4.4 **Community Contributor** – Anticipates consequences*
2. Support the ethical and appropriate design and use of technology	P4.3 **Community Contributor** – Behave ethically P4.4 **Community Contributor** – Anticipates consequences*
3. Interpret constructive feedback	P1.4 **Communicator** – Evaluates information P1.2 **Communicator** – Listens actively*
4. Demonstrate networking skills for personal and professional improvement	P4.1 **Community Contributor** – Builds community
5. Communicate IT concepts orally and in writing to nontechnical audiences	P1.4 **Communicator** – Conveys ideas effectively
6. Work collaboratively as part of a team, including global teams	P2.2 **Problem Solver** – Collaborates P4.2 **Community Contributor** – Respectfully Engages Own and Other Cultures*

EXPECTATIONS, GUIDELINES, AND POLICIES

Attendance:

A basic requirement of this course is that you will participate in all class meetings, whether online or face-to-face, and conscientiously complete all required course activities and assignments. Class attendance is required for classroom-based courses. It entails being present and attentive for the entire class period. Attendance shall be taken in every class. If you do not sign the attendance sheet while in class, you shall be marked absent. Signing the attendance sheet for another student is prohibited. The instructor is required to submit to the Registrar a record of student attendance, and action shall be taken if the record conveys a trend of absenteeism.

Only the following are acceptable excuses for absences: death in the immediate family (e.g. mother, father, spouse, child, or sibling), hospitalization or serious illness; jury duty; court ordered summons; religious holiday; university/school coordinated athletic or scholastic activities; an unanticipated event that would cause attendance to result in substantial hardship to one's self or immediate family. Absences must be explained with the submission of appropriate documentation to the satisfaction of the instructor, who will decide whether missed work may be made up. Absences that do not satisfy the above criteria are considered unexcused. To protect your privacy, doctor's excuses should exclude the nature of the condition and focus instead on how the condition impacts your attendance and academic performance.

Missing class reduces your grade through the following grade reduction policy: You are allowed two excused or unexcused absences. Each additional absence, unless excused, results in a 5% reduction in your final course grade. More than six absences result in an F in the course. Missing class may also reduce your grade by eliminating opportunities for class participation. For all absences, the student is responsible for all covered materials and assignments.

Incomplete:

The instructor may assign an Incomplete (I) grade only if at least 75% of the required coursework has been completed at passing quality and holding you to previously established time limits would result in unjust hardship to you. All unfinished work must be completed by the date set by the instructor. Left unchanged, an Incomplete automatically becomes an F after one year. http://registrar.iupui.edu/incomp.html

Deliverables:

You are responsible for completing each deliverable (e.g., assignment, discussion, project/paper) by its deadline and submitting it by the specified method. Deadlines are outlined in the syllabus or in supplementary documents accessible through Canvas. Should you miss a class, you are still responsible for completing the deliverable and for finding out what was covered in class, including any new or modified deliverable. In fairness to the instructor and students who completed their work on time, a grade on a deliverable shall be reduced 10%, if it is submitted late and a further 10% for each 24-hour period it is submitted after the deadline.

Assignments and Grading Information

1. ***Research Project*** **(Final)** **500 points**
   15–20-page in-depth research paper on a particular disability category and type of assistive technology. Research will include nature of the particular disability category, an in-person interview with a person who has that type of disability, and/or a family member or care provider, specific equipment recommendations, training outline, identification of relevant community resources, and development of a resource-kit for current and future needs related to the particular disability category.
2. ***Video Demonstration*** **(mid-semester)** **200 points**
   20–30 recorded/produced video including hands-on demonstration or instructional workshop using AT device, apps, or related assistive technology.
3. ***Discussion Board Posts*** **(weekly)** **300 points**
   Topics based on weekly lesson content.

Total: **1,000 points**

WEEKLY SCHEDULE

Week of	Topic (Reading)	Assignments Due
August 26, 2019	Introduction, laws, history of disability and accessibility (Anson Ch. 1 and supplemental material)	Discussion week 1
Sepeptt 2, 2019	Disability funding sources and the business case for accessibility (Anson Ch. 9 and supplemental material)	Discussion week 2
Sept. 9, 2019	Person first vs Identity first language, medical vs. social model of disability, and disability culture and etiquette (Supplemental material)	Discussion week 3
Sept. 16, 2019	AT consideration, selection, and assessment overview (SETT, WATI, and supplemental materials)	Discussion week 4
Sept. 23, 2019	Vision and sensory-related accessibility and AT (Anson Ch. 3 & 6 and supplemental material)	Discussion week 5
Sept. 30, 2019	Mobility-related accessibility and AT (Anson Ch. 5, 8, 10 & 12)	Discussion week 6
Oct. 7, 2019	Ergonomics (OSHA web materials)	Discussion week 7
Oct. 14, 2019	Cognition and Intellectual Disability-related accessibility and AT (Anson Ch. 7 and supplemental material)	Discussion week 8 --- **Video demonstration**

		project (mid-term)
Oct. 21, 2019	Fall Break	None
Oct. 28, 2019	Communication AT (Anson Ch. 4 and supplemental material)	Discussion week 9
Nov. 4, 2019	Independent living, Universal Design, and low-tech AT (Supplemental materials)	Discussion week 10
Nov. 11, 2019	AT in education (Cast.org and supplemental material)	Discussion week 11
Nov. 18, 2019	Internet of Things and home automation (Anson Ch. 2 and supplemental material)	Discussion week 12
Nov. 25, 2019	Accessibility built into operating systems (Microsoft, Apple, and Linux supplemental material) [Thanksgiving week]	Discussion week 13
Dec 2, 2019	Community resources and the AT Industry (ATIA, RESNA, and supplemental material)	Discussion week 14
Dec 9, 2019	Accessible recreation and gaming (Ablegamers and supplemental material)	Discussion week 15
Dec 16, 2019	Last day of class	**Final Paper Due – Dec 18, 2019**

Grading Scale:

A+	97–100%	Professional level work, showing highest level of achievement
A	93–96.99%	Extraordinarily high achievement, quality of work; shows command of the subject matter
A–	90–92.99%	Excellent and thorough knowledge of the subject matter
B+	87–89.99%	Above average understanding of material and quality of work
B	83–86.99%	Mastery and fulfillment of all course requirements; good, acceptable work
B–	80–82.99%	Satisfactory quality of work
C+	77–79.99%	Modestly acceptable performance and quality of work
C	73–76.99%	Minimally acceptable performance and quality of work
C–	70–72.99%	Unacceptable work (Core course must be repeated for credit)
D+	67–69.99%	Unacceptable work (Course must be repeated for credit)
D	63–66.99%	Unacceptable work
D–	60–62.99%	Unacceptable work
F	Below 60	Unacceptable work

No credits are granted for a grade below C.

CODE OF CONDUCT

All students should aspire to the highest standards of academic integrity. Using another student's work on an assignment, cheating on a test, not quoting or citing references correctly, or any other form of dishonesty or plagiarism shall result in a grade of zero on the item and possibly an F in the course. Incidences of academic misconduct shall be referred to the Department Chair and repeated violations shall result in dismissal from the program.

All students are responsible for reading, understanding, and applying the *Code of Student Rights, Responsibilities and Conduct* and in particular the section on academic misconduct. Refer to *The Code* > *Responsibilities* > *Academic Misconduct* at http://www.indiana.edu/~code/. All students must also successfully complete the Indiana University Department of Education "How to Recognize Plagiarism" Tutorial and Test. https://www.indiana.edu/~istd You must document the difference between your writing and that of others. Use quotation marks in addition to a citation, page number, and reference whenever writing someone else's words (e.g., following the *Publication Manual of the American Psychological Association*). To detect plagiarism instructors apply a range of methods, including Turnitin.com. http://www.ulib.iupui.edu/libinfo/turnitin

Academic Misconduct:

1. **Cheating:** Cheating is considered to be an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or environment.
   a. A student must not use external assistance on any "in-class" or "take-home" examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.
   b. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare work, without advanced authorization from the instructor to whom the work is being submitted.
   c. A student must not use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.
   d. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student's individual work.
   e. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.
   f. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.
   g. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom the work is being submitted.
   h. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.

2. **Fabrication:** A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.
3. **Plagiarism:** Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered "common knowledge" may differ from course to course.
    a. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
    b. A student must give credit to the originality of others and acknowledge indebtedness whenever:
        1. directly quoting another person's actual words, whether oral or written;
        2. using another person's ideas, opinions, or theories;
        3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
        4. borrowing facts, statistics, or illustrative material; or
        5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment
4. **Interference:** A student must not steal, change, destroy, or impede another student's work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any student's grade or the evaluation of academic performance. Impeding another student's work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.
5. **Violation of Course Rules:** A student must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the course materials that are rationally related to the content of the course or to the enhancement of the learning process in the course.
6. **Facilitating Academic Dishonesty:** A student must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

OTHER POLICIES

1. **Administrative withdrawal:** A basic requirement of this course is that students participate in all class discussions and conscientiously complete all required course activities and/or assignments. If a student is unable to attend, participate in, or complete an assignment on time, it is the student's responsibility to inform the instructor. If a student misses more than half of the required activities within the first 25% of the course without contacting the instructor, the student may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period, and a student who has been administratively withdrawn from a course is ineligible for a tuition refund. Contact the instructor with questions concerning administrative withdrawal.

2. **Civility:** To maintain an effective and inclusive learning environment, it is important to be an attentive and respectful participant in lectures, discussions, group work, and other classroom exercises. Thus, unnecessary disruptions should be avoided, such as ringing cell phones, engagement in private conversations, and other unrelated activities. Cell phones, media players, or any noisy devices should be turned off during a class. Texting, surfing the Internet, and posting to Facebook or Twitter during class are generally not permitted. Laptop use may be permitted if it is used for taking notes or conducting class activities. Students should check with the instructor about permissible devices in class. IUPUI nurtures and promotes "a campus climate that seeks, values, and cultivates diversity in all of its forms and that provides conditions necessary for all campus community members to feel welcomed, supported, included, and valued" (IUPUI Strategic Initiative 9). IUPUI prohibits "discrimination against anyone for reasons of race, color, religion, national origin, sex, sexual orientation, marital status, age, disability, or veteran status" (Office of Equal Opportunity). Profanity or derogatory comments about the instructor, fellow students, invited speakers or other classroom visitors, or any members of the campus community shall not be tolerated. A violation of this rule shall result in a warning and, if the offense continues, possible disciplinary action.
3. **Communication:** For classroom-based courses, the instructor or teaching assistant should respond to emails by the end of the next class or, for online courses, within two Indiana University working days, which excludes weekends and holidays. The instructor should provide weekly office hours or accept appointments for face-to-face, telephone, or teleconferenced meetings, and announce periods of extended absence in advance.
4. **Counseling and Psychological Services (CAPS):** Students seeking counseling or other psychological services should contact the CAPS office by phone at 274-2548 or email at capsindy@iupui.edu. For more information visit http://life.iupui.edu/caps/.
5. **Course evaluations:** Course evaluations provide vital information for improving the quality of courses and programs. Students are urged to complete one course and instructor evaluation for each section in which they are enrolled at the School of Informatics and Computing with the following three exceptions: (a) The student has withdrawn from the course; (b) fewer than five students are enrolled in the section (in which case maintaining anonymity is difficult); and (c) the section is a laboratory that must be taken with a course having a different section number. Course evaluations are completed at https://soic.iupui.edu/app/course-eval/. Course evaluations are typically open from the eleventh week. Course evaluations are anonymous, which means that no one can view the name of the student completing the evaluation. In addition, no one can view the evaluation itself until after the instructor has submitted the final grades for the course. In small sections, demographic information should be left blank, if it could be used to identify the student.
6. **Disabilities policy:** In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. Please notify the instructor during the first week of class of accommodations needed for the course. Students requiring accommodations because of a disability must register with Adaptive Educational Services (AES) and complete the appropriate AES-issued before receiving accommodations. The AES office is located at UC 100, Taylor Hall (Email:

aes@iupui.edu, Tel. 317 274-3241). Visit http://aes.iupui.edu for more information.

7. **Email:** Indiana University uses your IU email account as an official means of communication, and students should check it daily for pertinent information. Although you may have your IU email forwarded to an outside email account, please email faculty and staff from your IU email account.
8. **Emergency preparedness:** Safety on campus is everyone's responsibility. Know what to do in an emergency so that you can protect yourself and others. For specific information, visit the emergency management website. http://protect.iu.edu/emergency
9. **IUPUI course policies:** A number of campus policies governing IUPUI courses may be found at the following link: http://registrar.iupui.edu/course_policies.html
10. **No class attendance without official enrollment.** Only those who are officially enrolled in this course may attend class unless they are enrolled as an auditor or making up an Incomplete by prior arrangement with the instructor. This policy does not apply to those assisting a student with a documented disability, serving in an instructional role, or administrative personnel. http://registrar.iupui.edu/official-enrollment-class-attendance.html Children may *not* attend class with their parents, guardians, or childcare providers.
11. **Religious holidays:** Students seeking accommodation for religious observances must submit a request form to the course instructor by the end of the second week of the semester. For information visit http://registrar.iupui.edu/religious.html.
12. **Right to revise:** The instructor reserves the right to make changes to this syllabus as necessary and, in such an event, will notify students of the changes immediately.
13. **Sexual misconduct:** IU does not tolerate sexual harassment or violence. For more information and resources, visit http://stopsexualviolence.iu.edu/.
14. **Student advocate:** The Student Advocate provides assistance to students with personal, financial, and academic issues. The Student Advocate Office is located in the Campus Center, Suite 350. The Student Advocate may also be contacted by phone at 317 274-4431 or by email at studvoc@iupui.edu. For more information visit http://studentaffairs.iupui.edu/advocate.

MISSION STATEMENT

The Mission of IUPUI is to provide for its constituents excellence in

- Teaching and Learning;
- Research, Scholarship, and Creative Activity; and
- Civic Engagement.

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community;
- A commitment to ensuring diversity; and
- Pursuit of best practices.

IUPUI's mission is derived from and aligned with the principal components—Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices—of Indiana University's Strategic Directions Charter.

STATEMENT OF VALUES

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its location in Indiana's capital city and is committed to serving the needs of its community. Thus, IUPUI students, faculty, and staff are involved in the community, both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and professional development of its students, faculty, and staff and to continuous improvement of its programs and services.