

# Gerontechnology II

Spring 2016

Tuesdays 9:10 – 12:00, EME 52

## Course Instructors

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## Course Web Page

The class web page is available at <http://eecs.wsu.edu/~cook/gt2>. Most of the class materials are available online, including the syllabus, homework assignments, papers, and lecture materials. *Instructional materials can be accessed at this web page.*

## Catalog Course Description

**Psych 486 / CptS 486 / CptS 580** Gerontechnology II 3 Course Prerequisite: Certified in major or consent of instructor.

## Required Instructional Material

Given that this is an emerging area of study, there are no available textbooks that fully cover the integrated aspects of the course material. Instead, students will be reading original research articles as well as book chapters to develop both breadth and depth in the subject matter of gerontechnology. A list of reading materials that may be updated to include additional readings can be found at the end of the course syllabus. There are a few Gerontechnology books that are available as optional resources, these are listed at the end of the syllabus as well.

## Course Overview

In this class, we will continue our introduction to the principles of Gerontechnology, an interdisciplinary field that combines gerontology and technology. The class will consist of lectures, group discussion, guest presentations, homework assignments, and a multi-disciplinary research project. Following completion of this course, students should (1) have an understanding of the major topics of research in gerontechnology, (2) have a basic understanding of the aging process and research methodology in aging, which will provide the foundation for development of assistive technologies, (3) have a working knowledge of basic technologies that are used to monitor, assess and assist the health of older adults, and (4) have gained experience performing research in multi-disciplinary teams.

## Specific Course Learning Outcomes and Assessments

Because this class includes aspects of scientifically-validated psychological testing and an introduction to engineering methods for data collection, analysis, and design of health-assistive tools, it provides a unique opportunity to strengthen skills in each of the WSU Seven Learning Goals and Outcomes: 1) Critical and Creative Thinking, 2) Quantitative Reasoning, 3) Scientific Literacy, 4) Information Literacy, 5) Communication, 6) Diversity, and 7) Depth, Breadth, and Integration of Learning. The methods and measures for each goal is summarized in the table.

<b>WSU Learning Outcome</b>	<b>Goal (by end of course)</b>	<b>Course topics that address the learning outcome</b>	<b>Evaluation</b>
<b>Critical and Creative Thinking</b>	Assess the accuracy and validity of presented study results, define strategy to address posed challenges related to aging	<ul style="list-style-type: none"> <li>• Research methodology in aging</li> <li>• Human factors</li> <li>• Ethics, acceptance</li> </ul>	<ul style="list-style-type: none"> <li>• Paper presentations</li> <li>• Paper</li> <li>• Poster</li> </ul>
<b>Quantitative Reasoning</b>	Grasp properties involved in psychological assessment; grasp methods of sensor-based data collection and analysis	<ul style="list-style-type: none"> <li>• Sensors</li> <li>• Smart environments</li> <li>• Research methods</li> </ul>	<ul style="list-style-type: none"> <li>• Homework assignment</li> <li>• Paper</li> <li>• Poster</li> </ul>
<b>Scientific Literacy</b>	Identify issues related to aging, be aware of and understand state-of-the-art research in gerontechnology	<ul style="list-style-type: none"> <li>• Aging and: senses, health care, mobility, cognition, everyday function</li> <li>• Guest lectures on current research</li> </ul>	<ul style="list-style-type: none"> <li>• Guest lecture summaries</li> <li>• Paper presentation</li> <li>• Paper</li> <li>• Poster</li> </ul>
<b>Information Literacy</b>	Be able to access and utilize literary resources to understand a gerontechnology challenge	<ul style="list-style-type: none"> <li>• Research methods</li> </ul>	<ul style="list-style-type: none"> <li>• Paper presentation</li> <li>• Paper</li> <li>• Poster</li> </ul>
<b>Communication</b>	Present the results of a research project orally and in writing	<ul style="list-style-type: none"> <li>• Research project</li> </ul>	<ul style="list-style-type: none"> <li>• Paper presentation</li> <li>• Paper</li> <li>• Poster</li> </ul>
<b>Diversity</b>	Be aware of ethical issues related to gerontechnology; understand diversity of cultures in views on aging	<ul style="list-style-type: none"> <li>• Ethics</li> <li>• IRB discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Guest lecture summaries</li> </ul>
<b>Depth, Breadth, and Integration of Learning</b>	Understand issues related to practical application of technologies to address issues in aging	<ul style="list-style-type: none"> <li>• Guest lectures on current research</li> <li>• Multi-disciplinary research project</li> </ul>	<ul style="list-style-type: none"> <li>• Guest lecture summaries</li> <li>• Paper presentation</li> <li>• Paper</li> <li>• Poster</li> </ul>

## Course Requirements

- (1) *Summaries of Guest Speakers (30% undergraduate students, 25% graduate students).*  
We will bring in experts this semester who will talk about state of the art research in gerontechnology and their experiences in clinical application of the technologies. You will be required to write a two-page discussion of each of these invited talks that are due by 9am on the the next class period and should be emailed to [thao.vo@wsu.edu](mailto:thao.vo@wsu.edu). The write-up should include
  - a) a summary of the talk
  - b) a discussion of how the work fits within the context of the materials being discussed in class - you must include references to at least two articles that you have read for class as well as discuss class materials
  - c) your ideas about how the speaker's work could be extended in the future
- (2) *Homework Assignment (10%).* You will be given one homework assignment to complete. This assignment will involve modifying existing apps to enhance them for use by older adults. More precise information about the homework assignment is available on the class web page. *The completed homework assignment should be emailed to [thao.vo@wsu.edu](mailto:thao.vo@wsu.edu) by 9am on the due date.*
- (3) *Paper Presentation (15% undergraduate students, 10% graduate students).* You will give one presentation to the class during the semester. For undergraduate students, the presentation will summarize a paper on a Gerontechnology topic for the class and relate the material to discussions we have in class throughout the semester. For graduate students, the presentation will summarize a topic area that is supported by more than one paper found through a literature review. Your top 3 choices for presentation topics and dates is due by email to [thao.vo@wsu.edu](mailto:thao.vo@wsu.edu) by 9am on February 2<sup>nd</sup>.
- (4) *Research Project (40% undergraduate students, 50% graduate students).* Throughout the Gerontechnology II class, you will contribute to an ongoing multi-disciplinary gerontechnology research project. You will present a poster at the end of the semester (4/26) highlighting the project and your contributions and discuss your research results with visitors at the poster session. Graduate students will also write a paper and email it to [thao.vo@wsu.edu](mailto:thao.vo@wsu.edu) by 9am on 5/2.
- (5) *Class Participation (5%).* You will be encouraged to ask questions throughout the semester during lectures and guest speaker talks. You will also be expected to participate in class discussions.

## Research Project

One of the requirements for this class is that you contribute to a research project focused on applying technology to one of the health challenges discussed in this class. Faculty, researchers, and graduate students will visit the class to describe ongoing research studies and you will have an opportunity to choose one of the projects on which you will work. Each of the projects is multidisciplinary, combining ideas and expertise from Psychology, Engineering, and Computer Science. Several research team meetings are scheduled throughout the semester. You will be expected to have made progress between each meeting but the meeting is also a time for you to obtain guidance on how to proceed with the project. The research project dates are:

- April 24: Email a pdf file containing a 36"x48" poster highlighting details of your research work to [thao.vo@wsu.edu](mailto:thao.vo@wsu.edu) by 9am. The poster will be printed and displayed for the poster session.
- April 26: Poster session. Discuss the research project, your specific contribution to the team and the project, project results, expected and unexpected challenges, and ideas for future work. This discussion will be conducted in an informal setting for the instructors, fellow students, and visitors.
- **Graduate students only.** May 2: Paper due. Graduate students will additionally be asked to write a paper detailing their research project. The paper should be at least 10 pages, 11 point font, with 1 inch margins. The paper should include these sections. For graduate students the paper will comprise 50% of the research project grade. Email the paper by 9am on the due date to [thao.vo@wsu.edu](mailto:thao.vo@wsu.edu).
  - Project introduction: background, motivation
  - Hypothesis
  - Literature Review
  - Methods
  - Experimental analyses and findings
  - Discussion and Conclusions

**Attendance:** Weekly attendance is strongly encouraged. While students may miss class for urgent reasons, absences that are not cleared with the instructors will factor into the Class Participation portion of the semester grade.

**Policy Regarding Late Work:** Assignments are expected to be emailed by the listed due date and time. However, assignments that are turned in up to one day late will be accepted with a 20% grade penalty and assignments turned in up to two days late will be accepted with a 40% grade penalty. Assignments turned in more than two days late will not be accepted.

**Students with Disabilities:** Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please either visit the Access Center (Washington Building 217) or call 509-335-3417 to make an appointment with an Access Advisor. All accommodations **MUST** be approved through the Access Center.

**Academic Integrity Policy:** <http://www.conduct.wsu.edu> As an institution of higher education, Washington State University is committed to principles of truth and academic honesty. All members of the university community share the responsibility for maintaining and supporting these principles. When a student enrolls in Washington State University, the student

assumes an obligation to pursue academic endeavors in a manner consistent with the standards of academic integrity adopted by the University. *To maintain the academic integrity of the community, the University cannot tolerate acts of academic dishonesty including any forms of cheating, plagiarism, or fabrication.* I will treat all such cases seriously, including class failure.

Washington State University reserves the right and the power to discipline or to exclude students who engage in academic dishonesty. To that end, the University has established rules defining prohibited academic dishonesty and the process followed when such behavior is alleged. These rules incorporate Washington State University's Academic Integrity Policy, the University-wide document establishing policies and procedures to foster academic integrity. This policy is applicable to undergraduate and graduate students alike, as it pertains to dishonesty in course work and related academic pursuits. In cases of dishonesty in research and original scholarship, the University's Policy and Procedural Guidelines for Misconduct in Research and Scholarship may take precedence over the policies and procedures contained herein.

**Safety Information:** Washington State University is committed to maintaining a safe environment for its faculty, staff, and students. Safety is the responsibility of every member of the campus community and individuals should know the appropriate actions to take when an emergency arises. In support of our commitment to the safety of the campus community the University has developed a Campus Safety Plan, <http://safetyplan.wsu.edu>. It is highly recommended that you visit this web site as well as the University emergency management web site at <http://oem.wsu.edu/> to become familiar with the information.

## Course Calendar

Date	Topic	Due by 9am
1/12	Syllabus / Data visualization Institutional Review Board (Malathi Jandhyala)	
1/19	Health-assistive apps IOS app programming lab	
1/26	Android apps Android app programming lab	
2/2	Mild cognitive impairment and dementia <i>Research team meetings</i>	Student presentation date / topic choices
2/9	Rehabilitation Guest speaker: Nathan Darnall	Homework assignment due
2/16	Student presentations Guest speaker: Rock Leung	Presentation materials due Guest speaker summary
2/23	Student presentations <i>Research team meetings</i>	Guest speaker summary
3/1	Student presentations Guest speaker: Dr. Sarah Farias	
3/8	Student presentations Health-assistive robotics	Guest speaker summary due
3/15	Spring Break	
3/22	Socialization and Caregiver challenges Caregiver panel and visitor: Judy Cornish	
3/29	Pervasive computing for socialization Guest speaker: Carolina Bottari	
4/5	Technology assistance for health concerns <i>Research team meetings</i>	Guest speaker summary due
4/12	Chronic health conditions Guest speaker: Jason Runyan	
4/19	<i>Research team meetings</i>	Guest speaker summary due Poster due 4/24 9am
4/26	Poster session	Papers for graduate student due 5/2 9am

## Reading List (required): Will be updated

1/19

Estrin, D. small data, where  $n = me$ . *Communications of the ACM*, 57(4):32-34, 2014.  
<http://dl.acm.org/citation.cfm?id=2580944>

2/2

\*Ghosh, S., Libon, D., & Lippa, C. (2014). Mild cognitive impairment: A brief review and suggested clinical algorithm. *American Journal of Alzheimer's Disease and Other Dementias*, 29(4), 293-302.

\*Rosenberg, L., & Nygård, L. (2014). Learning and using technology in intertwined processes: A study of people with mild cognitive impairment or Alzheimer's disease. *Dementia: The International Journal of Social Research and Practice*, 13(5), 662-677.

2/9

+Rymer, William; Jayaraman, Arun. (2015). Promises and challenges of neurorehabilitation technology. Dietz, Volker and Ward, Nick S. (Ed). *Oxford textbook of neurorehabilitation*, 359-362. New York, NY: Oxford University Press.

\*Seelye, A. M., Schmitter-Edgecombe, M., Das, B., & Cook, D. (2012). Application of cognitive rehabilitation theory to the development of smart prompting technology. *IEEE Reviews in Biomedical Engineering*, 5, 29-44.

2/16

Guest speaker, will email papers

2/23

Student presentations, will email papers

3/1

Student presentations, will email papers

Guest speaker, will email papers

3/8

Juan Fasola and Maja J. Matarić, "A Socially Assistive Robot Exercise Coach for the Elderly". *Journal of Human-Robot Interaction*, 2(2):3-32, Jun, 2013.  
<http://robotics.usc.edu/publications/media/uploads/pubs/32-1040-1-PB.pdf>

Student presentations, will email papers

3/22

\*Fonareva, I., & Oken, B. S. (2014). Physiological and functional consequences of caregiving for relatives with dementia. *International Psychogeriatrics*, 26(5), 725-747.

+Demiris, G. Information technology to support aging: implications for caregiving. In J. E. Gausler and R. L. Kane (Eds). *Family caregiving in the new normal*. New York, NY: Elsevier.

4/5

Guest speaker, will email papers

4/12

\*Terrie Vasilopoulos, Ashwin Kotwal, Megan J. Huisinsh-Scheetz, Linda J. Waite, Martha K. McClintock, and William Dale. Comorbidity and Chronic Conditions in the National Social Life, Health and Aging Project (NSHAP), Wave 2. *J Gerontol B Psychol Sci Soc Sci* 2014 69: S154-S165.

\*Chouvarda, I. G., Goulis, D. G., Lambrinouadaki, I., & Maglaveras, N. (2015). Connected health and integrated care: toward new models for chronic disease management. *Maturitas*, 82, 22-27.

Guest speaker, will email papers

- \*Available to WSU all campuses
- +must copy or order through interlibrary loan

### **Books on Gerontology (additional resources)**

- Lesnoff-Caravaglia, G. (editor). *Gerontechnology: Growing Old in a Technological Society*. Charles C. Thomas, 2007.
- Harrington, T.L. & Harrington, M.K. *Gerontechnology Why and How*. Shaker Publishing B.V., 2000.
- Burdick, D. & Kwon, S. *Gerontechnology: Research and Practice in Technology and Aging*. Springer, 2004.

- Taipale, V., Charness, N., & Graafmans, J.A.M. Gerontechnology: A Sustainable Investment in the Future. Ios, 1997.

### **Books, Journals and Readings to Consider for Presentation**

- Gerontechnology: International journal on the fundamental aspects of technology to serve the ageing society. <http://gerontechnology.info/index.php/journal/pages/view/journal>
- International Conference on Pervasive Computing Technologies for Healthcare (PervasiveHealth). <http://pervasivehealth.org/2015/show/home>
- IEEE Journal of Biomedical and Health Informatics. <http://jbhi.embs.org/>
- Technology and Health Care. <http://www.iospress.nl/journal/technology-and-health-care/>
- ACM UbiComp Workshop on Smart Health Systems and Applications. <https://sites.google.com/site/smarthealthsys2014/>
- International Conference on Smart Homes and Health Telematics. <http://www.icostconference.org/>
- Digital Health Journal. <http://dhj.sagepub.com/>