

	<b>Syllabus CLSC 6281 Assistive Technology: Engineering and Biotechnology: Principles &amp; Emerging Technologies</b>
<b>Time, Day, Location</b>	Fridays, 8:30 a.m. – 11:30 a.m. Classes will be held in the training room at Assistive Technology Partners (601 E. 18 <sup>th</sup> Ave., Suite 130). On snow days, call UCHSC at (303) 724-4636 for closing information.
<b>Faculty &amp; Contact Info.</b>	<ul style="list-style-type: none"> <li>▪ Greg McGrew, ME, Phone (303) 315-1289 Fax (303) 837-1208 email <a href="mailto:greg.mcgrew@ucdenver.edu">greg.mcgrew@ucdenver.edu</a></li> <li>▪ Cathy Bodine, PhD. CCC/SLP, Phone (303) 315-1281 Fax (303) 837-1208 email <a href="mailto:cathy.bodine@uchsc.edu">cathy.bodine@uchsc.edu</a></li> <li>▪ Maureen Melonis, M.N.S., CCC/SLP: Phone (303)-315-1283 Fax (303) 837-1208 email <a href="mailto:maureen.melonis@uchsc.edu">maureen.melonis@uchsc.edu</a></li> </ul>
<b>Brief course Description</b>	This course will bring together engineers, assistive technology students and students in other health care related areas. The students develop an understanding of engineering principles and the technical design process and emerging technologies relevant to assistive technology in the context of support for children with low incidence disabilities. The first two courses in our advanced coursework series in Assistive Technology will serve as prerequisites to this course. In addition to readings in technical, design, human interface and emerging technologies, the course will provide hands-on experience in several technologies to give the students a real-life appreciation of specific technologies and processes.
<b>Textbooks, Readings and Instructional Resources</b>	<p>Reading</p> <p>The readings for the course will be generated by the instructors and taken from a number of different texts. There is no text for this course. We will be taking material from books on a fair use basis and making it available to students on the BlackBoard system in order to comply with copyright regulations. In general the level of the material will be at a Scientific American, or advanced Scientific American level. Assigned readings will be provided at least one week in advance of discussing that material.</p>
<b>Objectives</b>	<p><b>COURSE OBJECTIVES</b></p> <p>Students will:</p> <ol style="list-style-type: none"> <li>1. Demonstrate knowledge of electronic, mechanical, computer science and biological engineering technologies as related to assistive technologies.</li> <li>2. Develop the capacity to read technical material as the level of sales presentations, appreciate the capability of the material, develop the ability to compare and contrast technologies for potential use in assistive technology settings</li> <li>3. Develop the capability to communicate across disciplinary boundaries as evidenced in written documents and team problem solving</li> <li>4. Develop the capability to work with specific technologies emerging as important in assistive technology as evidenced in specific laboratory projects.</li> </ol>
<b>Weekly Plan</b>	<p>Course code CLSC 6281</p> <p>August 29 – Engineering as Problem Solving</p> <p>September 5 – Communicating with Engineers</p> <p>September 12 – Mechanical Principles</p> <p>September 19 – Basic Electrical Principles</p> <p>September 26 – LAB (first assignment due)</p> <p>October 3 - Biomechanics</p> <p>October 10 – Properties of Materials</p> <p>October 17 – Human Factors</p> <p>October 24 – Industrial Design/Engineering</p> <p>October 31 – LAB (second assignment due)</p>

	November 7 – Computer Science Fundamentals I November 14 – Computer Science Fundamentals II November 21 – Augmentative/Alternative Communication November 28 – No Class - Holiday December 5 – LAB (third assignment due) December 12 – Future of Assistive Technology
<b>Grading</b>	The students will generate points for each assignment during the semester. All assignments will be graded on a 100 point scale. The first two assignments will be worth 20% of a student’s overall grade each. The final assignment will be worth 30%. And class participation and attendance will be worth 30%.

## Coursework Assignments:

Assignment #1: Students (in groups of 3) are presented the basics of a scenario involving a person with a disability and a task that he/she needs to perform independently. They will develop a problem statement or statements that characterize the problem(s); then contact an engineer assigned to them. With the engineer, they will present/discuss one of the problems (of their choosing), solicit insights, direction for solving problem. Essentially, they will fully carry out and document steps 1 and 2 of the problem solving process discussed in the first class. Groups, the engineer for each will be assigned during the class on September 5<sup>th</sup>.

This assignment is not about the AT involved, but about defining the fundamental issue or issues that must be solved to get this client to independently perform this task, and how the discussion with the engineer advanced the process. Each group will turn in one paper, 5-7 pages double spaced in APA style the includes the problem(s) statement(s), a summary of how they were developed, and a description of the Problem Analysis process, including summary of discussion with the engineer.

Assignment #2: Students will characterize design considerations required for a power wheelchair or complex AAC device w/ dynamic display (such as Dynovox DV4, PRC Vantage Plus) in terms of three mechanical , three electrical , and three human factors principles. Where appropriate, students will describe potential design conflicts and compromises designers/engineers face among the three different principles. Each student will write a paper describing the above. Paper will be 5-7 pages double spaced APA.

Assignment #3: Compare/contrast mechanical, electrical, human factors, and materials features of three different manufacturer’s versions of the same type of AT device.

- Reference manufacturer’s technical materials in discussing at least two of these features for at least two of the products.
- Include discussion of manufacturing’s potential influence on products’ design.
- Identify and describe those design features that were influenced by the designer’s biomechanical consideration of the user.
- Incorporate input from engineers, preferably from manufacturer, or from those conversant with design features of the product.

9 - 11 pages double-spaced, APA style. May include a chart or matrix summarizing comparisons.

Products:

Power wheelchair

Augmentative communication device (w/ cpu)

Programmable prompting device (w/ cpu)

Comprehensive electron aid to daily living

Other type of your choosing w/approval of instructor

## **CLASS POLICIES**

1. Attendance is expected. Students who miss class (or a portion of class) are responsible for obtaining the content from another class member. More than 1 unexcused absence requires a conference with the instructor, and may result in additional assignments or grade reduction. The instructor will discuss excused versus unexcused absences in class.
2. Each student is expected to come to class prepared. This includes having the text available and having done assigned readings and projects.
3. Late assignments will not be accepted without prior approval from the instructor. Assignments not accepted will be assigned a grade of zero.
4. New University policy requires that all students have access to a computer with at least a certain capability level. All students are required to make use of technological advances in coursework. Students will be required to make use of computer resources in several different ways in this class, including the Internet assignment, communication (e.g., class announcement) via e-mail, and, potentially, accessing some materials needed for class via the Web.
5. APA Style (5th edition) is required by the College of Education and this class. All assignments should be typed and double-spaced (except for those completed in class).
7. Language that is consistent with IDEA and emphasized people more than disabilities (“people-first” language) is to be used on assignments prepared outside of class. Points will be subtracted for inappropriate work.
8. Any student with a disability documented through Student Services is encouraged to contact the instructor right away so that appropriate accommodations may be arranged. In addition, certain accommodations (which will be discussed in class) are available to all students