The School of Health and Rehabilitation Sciences, Occupational Therapy Division is proposing to create a new certificate program in *Assistive and Rehabilitative Technology*.

The proposal was first reviewed by GS/CAA on February 11th, 2019. Revisions were requested on February 25th, 2019 and received on March 15th, 2019. The proposal was again reviewed by GS/CAA on April 15th, 2019. Revisions were requested on April 15th, 2019, and received on April 26th, 2019. The proposal was again reviewed by GS/CAA on April 29th, 2019. Revisions were requested on May 1st, 2019, and received on June 18th, 2019. The proposal was again reviewed by GS/CAA on June 18th, 2019. No further revisions were requested, and the proposal was recommended for approval by the Graduate Council. The proposal was approved by e-vote of the Graduate Council on July 23rd, 2019.
Dear Marcia,

The GS/CAA subcommittee, which I chair, reviewed the revised proposal for an Assistive Rehabilitation Technology Certificate on 18 June 2019. The subcommittee appreciated the separate sections that clearly articulate the learning goals and assessment plans for the three different types of certificates. The subcommittee had one suggestion, that you might change the certificate completion sheet from fill-in-the-blank forms to a pre-populated check box form, for ease of use. The suggestion does not rise to the level of a required revision that would delay our recommendation for approval, so we will be moving the proposal forward to Graduate Council for review. If you would like to revise the certificate completion sheets, and have them included with the proposal when it goes to Graduate Council, please send an updated full proposal with a cover letter reminding us that the completion sheets have been revised. If you will decline to revise the sheets, please let us (Laura Pearce, my administrative associate cc:d here and me) know.

I’ll keep you posted as the proposal moves along.

Best,
Shari

---

Shari R. Speer, PhD
Associate Dean for Academic Affairs
Professor of Linguistics
Graduate School
250D University Hall, 230 N. Oval Mall, Columbus, OH 43210
614.292.9490
speer.21@osu.edu
Thanks, Marcia. I will get this onto an upcoming GS/CAA meeting agenda.

Best,
Shari

--

Shari R. Speer, PhD
Associate Dean for Academic Affairs
Professor of Linguistics
Graduate School
250D University Hall, 230 N. Oval Mall, Columbus, OH 43210
614.292.9490
speer.21@osu.edu

From: "Nahikian-Nelms, Marcia" <Marcia.Nahikian-Nelms@osumc.edu>
Date: Wednesday, May 15, 2019 at 12:13 PM
To: "Shari Speer (OSU)" <speer.21@osu.edu>
Cc: "Digiovine, Carmen" <Carmen.Digiovine@osumc.edu>
Subject: RE: Assistive Rehabilitation Technology Certificate

Dr. Speer: I have attached to this email a revision of the Assistive Rehabilitation Technology Certificate addressing the GCS comments and recommendations. We have included a clean copy as well as the version with tracked changes. Thank you.

Marcia

Marcia Nahikian-Nelms, PhD, RDN, LD, FAND
Professor, Clinical Director, Academic Affairs
School of Health and Rehabilitation Sciences
College of Medicine
The Ohio State University
453 West Tenth Avenue
Columbus OH 43210
614-292-4758

From: Speer, Shari <speer.21@osu.edu>
Sent: Wednesday, May 1, 2019 5:38 PM
To: Nahikian-Nelms, Marcia <Marcia.Nahikian-Nelms@osumc.edu>
Dear Marcia,

The GS/CAA curricular subcommittee, which I co-chair with faculty fellow Jennifer Schlueter, reviewed the revised Assistive Rehabilitation Technology Certificate on 29 April 2019. The subcommittee acknowledged the uniqueness of this proposal, where one set of required coursework can serve as the curriculum for three different types of certificate (categories 2, 3a and 5). The subcommittee accepts the single proposal approach, and expressed enthusiasm about the ARTC program. At the same time, they emphasized that the three types of certificate differ in their qualifications and procedures for admission. The certificate types as proposed will also differ in the educational goals and expected outcomes of the targeted students, and thus should have different learning goals. The subcommittee would like to see these differences addressed in a revised proposal, and had the specific requests listed below. When you undertake these, please include a cover letter pointing the subcommittee to the places in the document that have been revised.

1. Please include an MOU from ODEE for turning Augmentation and Alternative Communications (discussed on p. 7 of the PDF) into an online course.
2. Please include, for each of the three certificate types, your program’s learning goals and assessment plan. The subcommittee notes that these will differ for the different student populations served by the different certificate types.
3. Please create and include advising sheets, one for each category of certificate, for student use to aid them in mapping their way through the curriculum for the certificate. The committee noted that category 2 certificates have very different curricular requirements from those for categories 3a and 5. Include full course numbers when courses are mentioned, using the precise prefixes and numbers as used by the Registrar’s Office  https://registrar.osu.edu/transfer_credit/depts.asp#P

Upon receipt of this revision, the subcommittee will revisit and, if satisfied, move this proposal forward to the Graduate Council. I want to make a note that Jen Schlueter is leaving us for better things as of May 3, and will no longer be co-chairing the committee with me. I will keep you posted as this moves along.

Best,
Shari

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**The Ohio State University**

**Shari R. Speer, PhD**  
Associate Dean for Academic Affairs  
Professor of Linguistics  
Graduate School  
250D University Hall, 230 N. Oval Mall, Columbus, OH 43210  
614.292.9490  
speer.21@osu.edu

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**From:** "Nahikian-Nelms, Marcia" <Marcia.Nahikian-Nelms@osumc.edu>  
**Date:** Friday, April 26, 2019 at 1:40 PM  
**To:** "Schlueter, Jennifer" <schlueter.10@osu.edu>
Cc: "Shari Speer (OSU)" <speer.21@osu.edu>, "Digiovine, Carmen" <Carmen.Digiovine@osumc.edu>

Subject: RE: Assistive Technology and Rehabilitation Certificate

Dear Dr. Schlueter and Associate Dean Speer:

Please find attached to this email a revision (and repackaging) of the Proposal for the Assistive Rehabilitative Technology Certificate. Within the cover letter, we have identified the edits within the proposal. We also have attached to this email a version with tracked changes in case that might assist.

After speaking with Vice Provost Smith and Dr. Bielefeld from CAA, we understand that there is no explicit rule that one proposal cannot be used for more than one type of certificate. We do know that this proposal is unique in that it does meet the need of multiple audiences and certainly is different from most certificate proposals. We, therefore, have left the proposal request to be considered for certificate types: 2, 3b and 5.

Thank you again for all of your assistance with the proposal.

Best regards,
Marcia

Marcia Nahikian-Nelms, PhD, RDN, LD, FAND
Professor, Clinical Director, Academic Affairs School of Health and Rehabilitation Sciences College of Medicine The Ohio State University 453 West Tenth Avenue Columbus OH 43210 614-292-4758

From: Schlueter, Jennifer <schlueter.10@osu.edu>
Sent: Monday, April 15, 2019 5:13 PM
To: Nahikian-Nelms, Marcia <Marcia.Nahikian-Nelms@osumc.edu>
Cc: Speer, Shari <speer.21@osu.edu>
Subject: Re: Assistive Technology and Rehabilitation Certificate/MDN degree proposal

Dear Professor Nahikian-Nelms:

At our 15 April 2019 meeting, the combined Graduate School/CAA curriculum subcommittee, which I co-chair with Associate Dean Shari Speer, was slated to review this revised proposal. However, because it came to us in several small pieces (via a zipped file), we had a difficult time parsing it. Please resubmit as a single document with a cover letter that makes it clear where in the revised proposal each request from the committee has been addressed. Please note that a Certificate must be proposed for and approved in one category. I’m attaching an overview of the types of Certificates here.
Upon receipt of the revised and integrated proposal, the subcommittee will revisit.

Best,
Jen

Jennifer Schlueter, PhD
Associate Professor and Lab Series Producer: Department of Theatre
Project Director: Creative Practice and Civic Engagement Discovery Theme
Faculty Fellow for Curriculum: Graduate School
1103 Drake Performance and Event Center
1849 Cannon Drive / Columbus OH / 43210-1234
614.688.3778 / jenniferschlueter.com

From: "Nahikian-Nelms, Marcia" <Marcia.Nahikian-Nelms@osumc.edu>
Date: Monday, February 25, 2019 at 2:47 PM
To: "Shari Speer (OSU)" <speer.21@osu.edu>
Cc: "Schlueter, Jennifer" <schlueter.10@osu.edu>, Jill Toft <toft.20@osu.edu>
Subject: RE: Assistive Technology and Rehabilitation Certificate/MDN degree proposal

Shari,
Thank you so much for your assistance. We will make those edits to the ARTC proposal and return to your subcommittee ASAP.

Marcia

Marcia Nahikian-Nelms, PhD,RDN,LD,FAND
Professor, Clinical
Director, Academic Affairs
School of Health and Rehabilitation Sciences
College of Medicine
The Ohio State University
453 West Tenth Avenue
Columbus OH 43210
614-292-4758

O-H!

From: Speer, Shari <speer.21@osu.edu>
Sent: Monday, February 25, 2019 1:13 PM
To: Nahikian-Nelms, Marcia <Marcia.Nahikian-Nelms@osumc.edu>
Cc: Schlueter, Jennifer <schlueter.10@osu.edu>; Toft, Jill A. <toft.20@osu.edu>
Subject: Re: Assistive Technology and Rehabilitation Certificate/MDN degree proposal
Hi Marcia,

I apologize that our response on the ATRC proposal review has been delayed. I have been out sick, Jen has been traveling, and my Administrative Associate, Jill Toft, has just accepted a new position in OIA. The combination has slowed our process. I don’t think this should be typical of us in the future (especially once a new person is hired).

Regarding the MDN, the revised proposal Dr. Taylor submitted has been posted to the CCGS (Chancellor’s Council on Graduate Studies, Ohio Department of Higher Education) for their 4 week comment period. Jill notified Dr. Taylor on January 28 that this was done. We are awaiting comments from our 13 member institutions on the proposal. When these arrive (sometimes a day late), they will be collated and sent to you so that you can create a reply to the comments, revise the proposal, and prepare a powerpoint presentation for the meeting of CCGS (this is the process usually referred to as “going downtown.”) I am happy to assist you with that process.

My letter for the ATRC follows:

The GS / CAA subcommittee, which I co-chair with Faculty Fellow Jen Schlueter, reviewed your proposal for a Certificate in Assistive and Rehabilitation Technology at our meeting on Monday, February 11. The subcommittee was enthusiastic about the proposal, and had only a few requests for additional clarification. With your revised proposal, please include a cover letter that points the subcommittee to the locations in the document where revisions have been made to address the requests.

1. The introductory material notes that the certificate is intended for working professionals, but later in the document (p.4) there is a statement that OSU graduate and undergraduate students as well as non-degree seeking students are expected to enroll. Please clarify the student population(s) that the certificate is intended to serve. The committee’s concern is whether students will be drawn from current majors.

2. Please clarify the type of certificate you intend to develop. The subcommittee suggested that you might intend either type 3a or 3b. There is a chart of certificate types and their characteristics that you might find useful. It is on the graduate school website here: https://gradsch.osu.edu/sites/default/files/resources/pdfs/CertificatePrograms_categoriesAndCriteria.pdf

3. The committee requested that the material in Table 1, Sample Program, be expanded to include a listing of all courses planned for the program with their numbers. Specify those courses currently available for the program, or available from its initiation. The committee was concerned that the timing for offering potential electives listed and information about their availability was not specific.

Upon receipt of the revised proposal, the subcommittee will revisit and, if satisfied, move this forward to the Graduate Council for their review and approval. Jen and I will keep you posted as this moves along.

Best,
Shari

Shari R. Speer, PhD
Associate Dean for Academic Affairs
From: "Nahikian-Nelms, Marcia" <Marcia.Nahikian-Nelms@osumc.edu>
Date: Saturday, February 23, 2019 at 8:54 AM
To: "Shari Speer (OSU)" <speer.21@osu.edu>
Subject: Assistive Technology and Rehabilitation Certificate/MDN degree proposal

Good morning Shari:
I am writing to check on the status of both the ATRC certificate and the MDN degree proposal from the School of Health and Rehabilitation Sciences. I am hopeful you can give me an update on the status of these proposals and where we are on the needed edits, etc. Kevin Evans indicated to me that the ATRC certificate needed some minor edits to the proposal – primarily confirming the classification of certificate that was needed. Dr. Chris Taylor had submitted the revised document of the MDN degree proposal back to your office as well. I just want to make sure that we are keeping up with the steps we need to do on our end. Thanks for all of your help.

Best regards,
Marcia

Marcia Nahikian-Nelms, PhD,RDN,LD, FAND
Professor, Clinical
Director, Academic Affairs
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College of Medicine
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453 West Tenth Avenue
206 A Atwell Hall
Columbus OH 43210
614-292-4758
May 14, 2019

To Whom It May Concern:

Thank you for the opportunity to respond to the comments from the Graduate Studies Council on Academic Affairs curricular subcommittee with regards to the Assistive and Rehabilitative Technology (ART) Certificate program.

1. Please include an MOU from ODEE for turning Augmentation and Alternative Communications (discussed on p. 7 of the PDF) into an online course.

We do not currently have an MOU from ODEE for turning SPHHRNG 6860: Augmentative Communication into an online course. Therefore, we have removed the course from the ART Certificate program. Specifically, we removed SPHHRNG 6860 from the “Minimum requirements to complete program and sample program” section (page 2), the tables describing sample programs (Tables 1 & 2), and the course description (Appendix B). The current instructor plans on transitioning the course into an online course in the future. We will submit a request to add the course to the certificate program at that time.

2. Please include, for each of the three certificate types, your program’s learning goals and assessment plan. The subcommittee notes that these will differ for the different student populations served by the different certificate types.

We added program learning objectives for the three different certificate types to the proposal. (pages 8-10). We added a program assessment plan to the proposal (page 11), and added post-completion surveys for each type of certificate program (Appendix C).

3. Please create and include advising sheets, one for each category of certificate, for student use to aid them in mapping their way through the curriculum for the certificate. The committee noted that category 2 certificates have very different curricular requirements from those for categories 3a and 5. Include full course numbers when courses are mentioned, using the precise prefixes and numbers
We created a Curriculum Guide (Appendix D) and Advising Sheets (Appendix E) for each of the certificate types, which are included in the program proposal. We also included the full course numbers throughout the proposal.

Once again thank you for the opportunity to respond to the comments, and please feel free to contact me if you have any questions.

Sincerely,

Carmen P. DiGiovine, PhD ATP/SMS RET
Associate Professor – Clinical
April 19, 2019

To Whom It May Concern:

Thank you for the opportunity to respond to the comments from the Graduate Studies Council on Academic Affairs subcommittee with regard to the Assistive and Rehabilitative Technology (ART) Certificate program.

The ART Certificate program is intended to primarily serve non-degree seeking professionals, hence the courses will be provided in an on-line format. We anticipate the two largest cohorts of students will be working professionals who are not currently enrolled at The Ohio State University (OSU). In the context of the ART Certificate program, the largest cohort includes post-professional students from the fields of engineering, occupational therapy, physical therapy, rehabilitation counseling, special education and speech-language pathology. The second largest cohort includes current assistive technology professionals who are interested in continuing education opportunities and aspiring assistive technology professionals who are interested in completing the requirements for the RESNA Assistive Technology Professional (ATP) Certification or the RESNA Seating and Mobility Specialist (SMS) Certification. These certifications have academic, work experience and testing requirements, therefore, aspiring assistive technology professionals are often working while taking academic courses. Though not the primary focus of the program, we do anticipate that a small cohort of current students at OSU will be interested in the certificate program. The program meets the aspirations for employment or graduate school. The small number of students in this last cohort of is based on my experience over the past nine years as a collaborator with faculty in the School of Health and Rehabilitation Sciences, the Department of Biomedical Engineering, the Department of Mechanical and Aeronautical Engineering, and the Department of Speech and Hearing Sciences. Based on the projected enrollment, we do not anticipate that the certificate program will draw students away from current majors, rather it will meet the educational goals of a small number of students while maintaining their status within their current major.

- In the program proposal, we revised the first two paragraphs (pages 7 and 8) and the last paragraph (Page 9) of the “Adequate Enrollment” section to better articulate the case-mix of non-degree seeking and degree seeking students. We also clarify that the primary intent of the certificate program is to serve non-degree seeking professionals.

We are requesting certificate program categories 2, 3a and 5 for the ART Certificate Program. We are requesting category 2 to specifically meet the educational goals of undergraduate students in the engineering, health science, and speech and hearing science programs. We are requesting category 3a to meet the educational goals of non-degree seeking post-professional students, as we anticipate this will be the largest cohort of students. We are also requesting category 3a to meet the educational goals of
graduate students in the health sciences (e.g. Occupational Therapy, Physical Therapy). Finally, we are requesting category 5 to meet the educational goals of non-degree seeking professionals who have the assistive technology professional (ATP) certification or are aspiring to get the ATP certification. The ATP certification is administered by the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), and is a requirement for professional in the field of assistive and rehabilitative technology.

- In the program proposal, we added the “Certificate Program Category” section to explicitly request categories 2, 3a and 5, and to provide a rationale for this request (page 1).

With regards to the request for category 5 status, there is currently a shortage of assistive technology professionals to provide assistive technology for people with disabilities. The core of the assistive technology professional is the RESNA ATP certification because it is currently required by Medicare and some Medicaid programs in order to provide high-end wheelchairs. The assistive technology professional is employed by rehabilitation technology suppliers (e.g. NuMotion, National Seating and Mobility). There is a dearth of assistive technology professionals, and the majority of assistive technology professional are nearing retirement. Finally, there is not a clear educational pathway for individuals to become an assistive technology professional. The field of assistive technology is an enticing career for many individuals because of the hands-on aspects of the profession and the focus on technology integration. Furthermore, it is possible to attain the RESNA Assistive Technology Professional Certification without a bachelor’s degree. Therefore, the category 5 status allows the ART Certificate program to meet the educational needs of an untapped group of aspiring professionals, while also meeting the employment needs of rehabilitation technology suppliers.

The courses within the ART Certificate Program are currently available or were approved by the School of Health and Rehabilitation Sciences in the Fall of 2018. We have updated example program timelines in Tables 1 and 2 of the certificate program proposal to better represent the course sequence. We anticipate that the first course of the program, HTHRHSC 5100 will be offered during the Autumn 2019 semester, and the remaining HTHRHSC courses will be brought online in the ensuing semesters. We will continue to offer SPHHRNG 6860 during the summer semester.

- In the program proposal, we updated Tables 1 and 2 (pages 4 and 5). We also added the course numbers to the course descriptions in Appendix B.

Once again thank you for the opportunity to respond to the comments, and please feel free to contact me if you have any questions.

Sincerely,

Carmen P. DiGiovine, PhD ATP/SMS RET
Associate Professor – Clinical
November 15, 2018

James Onate, PhD
HRS Graduate Studies Chair

Sarah Varekojis, PhD
HRS Curriculum Committee Chair

Drs. Onate and Varekojis,

Please accept the request for the new Assistive and Rehabilitative Technology Certificate (ARTC) program within the School of Health and Rehabilitation Sciences. The purpose of the ARTC program is to educate health science, engineering, rehabilitation counseling and education professionals on the application of science and technology for improving the quality of life of individuals with disabilities. The ARTC program includes five courses: an introductory course and then four specialty programs. Students will need to complete the introductory course and three of the four specialty courses in order to successfully attain the certificate.

The courses within the ARTC include four new online courses and an existing course. The existing course, Augmentative and Alternative Communication, will transition from a traditional format to an online format upon initiation of the ARTC program.

- Introduction to Assistive Technology [new]
- Assistive Technology for Seating and Mobility [new]
- Computers Communication and Controls for Individuals with Disabilities [new]
- Assistive Technology for Sports and Recreation [new]
- Augmentative and Alternative Communication [existing – Speech and Hearing Science, College of Arts and Sciences]

The curriculum is designed to prepare undergraduate, graduate and post-professional students for the Assistive Technology Professional and the Seating and Mobility Specialist certifications, which are administered by the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA). Graduates of the ARTC program will be well positioned for employment opportunities within the fields of assistive technology, accessibility customer service, and rehabilitation technology, graduate school opportunities (clinical and research), and job promotion/transition opportunities.
I have attached the ARTC certificate of study proposal, the courses syllabi, course request forms, and letters of support/concurrence for your review. Feel free to contact me if you have any questions or if you need additional information.

Sincerely,

Carmen P. DiGiovin, PhD ATP/SMS RET
Associate Professor – Clinical

Enc.
ARTC certificate of study proposal
Syllabi
Course Request Forms
Letter of Support – Occupational Therapy Division
Letter of Support – Biomedical Engineering Department
Letter of Support – Speech and Hearing Sciences Department
Assistive and Rehabilitative Technology Certificate Program

Division: Occupational Therapy
School: Health and Rehabilitation Sciences
College: Medicine

Program Learning Goals

The goal of the enrolled students is two-fold: 1) obtain an Assistive Technology Professional (ATP) Certification and Seating and Mobility Specialist (SMS) Certification, and 2) distinguish themselves among their peers in the field. The completion of the certificate program and the attainment of the RESNA certification(s) will distinguish students as competent in the integration of technology for individuals with disabilities. The goals and learning outcomes of the certificate program focus on the application and design of assistive and rehabilitative technology for individuals with disabilities.

Program Goals

1. Students will understand the role of technology as it relates to individuals with disabilities.
2. Students will appreciate the AT service delivery process
3. Students will learn how to utilize rehabilitative technology in the AT service delivery process
4. Students will value the role of an interprofessional collaboration in the AT service delivery process
5. Students will understand the types of assistive and rehabilitative technology

Purpose of program

Currently, there are over 1 billion individuals with a disability throughout the world[1] and 56.7 million individuals with a disability in the United States[2]. The number of individuals with disabilities is increasing in the United States as the percentage rose from 11.9 in 2010 to 12.6 in 2013 and 2014. Furthermore, the rates of disability increase with age. [3]. These numbers are trending upwards given the decreased mortality due to acute injuries, accidents and medical events, and the increasing number of older adults who are aging into a disability. One mechanism for addressing the increasing number of individuals with disability is technology, which comes in the form of assistive technology and rehabilitative technology. Assistive technology is defined as any technology which improves the quality of life of individuals with a disability on a daily basis, and includes devices, services, practices and strategies[4]. Assistive technology is inclusive of mainstream technology (e.g. consumer electronics), educational technology and general-purpose technology, as well as technology designed specifically for individuals with disabilities, as the assistive part is defined by the use-case, not the individual components of the technology. Rehabilitative technology is defined as technology that is utilized by educational, engineering or healthcare professionals to measure performance or
maintain/increase function, typically in the school or healthcare settings [5]. In order to meet the needs of individuals with disabilities over the next generation, we will need to educate a workforce that can design, fabricate and implement both assistive and rehabilitative technology. The workforce will include clinicians, technicians, technologists, engineers, educators, rehabilitation counselors and researchers. Therefore, the purpose of the assistive and rehabilitative technology certificate (ARTC) program is to educate health science, engineering, rehabilitation counseling and education professionals on the application of science and technology for improving the quality of life of individuals with disabilities. The program will provide a foundation of assistive technology and rehabilitative technology principles that will translate into fields that support individuals with disabilities and older adults.

Certificate Program Category
We are requesting certificate program categories:
- 2 (Undergraduate Academic Certificate Program: Post Bachelor Degree),
- 3a (Graduate Academic Certificate Program: Post Bachelor Degree) and
- 5a (Technician / Professional Certification Program) for the ART Certificate Program.

We are requesting category 2 to specifically meet the educational goals of undergraduate students in the engineering, health science, and speech and hearing science programs. We are requesting category 3a to meet the educational goals of non-degree seeking post-professional students, as we anticipate this will be the largest cohort of students. We are also requesting category 3a to meet the educational goals of graduate students in the health sciences (e.g. Occupational Therapy, Physical Therapy) or non-degree seeking professionals who have the assistive technology professional (ATP) or seating and mobility specialist (SMS) certifications. Finally, we are requesting category 5a to meet the educational goals of non-degree seeking professionals who are aspiring to get the ATP certification and SMS certification. The ATP and SMS certifications are administered by the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA). The ATP certification is a pre-requisite for the SMS certification, and is a requirement for professionals in the field of assistive and rehabilitative technology.

Minimum requirements to complete program and sample program
The goal of the ARTC program is to complete the program in 2-4 semesters (9-16 months). The certificate program will include 4 online courses. The foundational course is HTHRHSC 5100: Introduction to Assistive Technology, which is required by all students in the program. The student will complete three specialty courses as part of the program. The specialty courses are HTHRHSC 5400: Computers, Communication and Controls for Individuals with Disabilities (CCC), HTHRHSC 5450: Assistive Technology for Sports and Recreation (ATSR), and HTHRHSC 5200: Assistive Technology for Seating and Mobility (ATSM). We anticipate 2 sections of each course, one for undergraduate credit and one for graduate credit. Course descriptions for each course can be found in Appendix B.
Flexibility of program and opportunity for electives

Initially there will be 3 specialty courses: CCC, ATSM, and ATSR. In the future we plan on incorporating other specialty courses, which would allow for greater flexibility when selecting specialty courses in the certificate program. The specialty courses include, but are not limited to: augmentative and alternative communication, driver rehabilitation, rehabilitation engineering design, rehabilitation science & technology (biomechanics and anthropometrics for individuals with disabilities), pediatric assistive technology, fieldwork/internships, and hands-on labs. We anticipate that we will begin to roll out the electives in 2022, depending on the success of the proposed certificate program.

Length of program compared to similar programs

The length of the certificate program is highly comparable to other assistive technology certificate programs offered in the United States. The proposed certificate program will consist of 12 mandatory credit hours, or 4 courses, in which the student has the ability to complete in 9-16 months (2-4 semesters). Example course sequence can be found in Tables 1 and 2. Currently, two online certificate programs exist with shorter program lengths: 1) California State University - Dominguez Hills (5 courses; 15 credits), and 2) California State University - Northridge (16 weeks; 7 course modules). These programs do not provide the sophistication of courses in which the proposed program has selected to implement. Additionally, Casper College offers a 16-week, 12 credit hour certificate program, but the student must attend classes on-campus. The University of Pittsburgh Rehabilitation Science and Technology Continuing Education (RSTCE) program, and the University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, both offer trainings and online courses for continuing education and eventual certification, if desired. The University of Illinois at Chicago has a 12-month, 12 credit program that can be completed on-line or as a hybrid program (on-line and lab-based). It is important to note that locating the lengths of comparable certificate programs via the programs’ websites proved challenging.

The length of the proposed ARTC program is consistent with, and in some cases shorter than, other programs. A 9-month (2 semester) program has the advantage of minimizing the impact on degree-seeking students because all specialty courses are offered at least once a year, and the foundational introduction to assistive technology course is offered 3 times a year. A 9-month program also minimizes the impact on non-degree seeking students because they will be prepared to take the RESNA ATP and SMS certification exams in only 2 semesters.
<table>
<thead>
<tr>
<th>Semester</th>
<th>Example 1 (16-months)</th>
<th>Status of course</th>
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<tr>
<td>Summer</td>
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<td>OPEN</td>
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<tr>
<td>Autumn</td>
<td>HTHRHSC 5100: Introduction to Assistive Technology</td>
<td>Curricular Approval 12/2018 Offered: Autumn 2019</td>
</tr>
<tr>
<td></td>
<td>HTHRHSC 5400: Computers, Communications and Controls for Individuals with Disabilities</td>
<td>Curricular Approval 12/2018 Offered: Autumn 2020</td>
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<tr>
<td>Spring</td>
<td>HTHRHSC 5200: Assistive Technology for Seating and Mobility</td>
<td>Curricular Approval 12/2018 Offered: Spring 2020</td>
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<tr>
<td></td>
<td>HTHRHSC 5450: Assistive Technology for Sports and Recreation</td>
<td>Curricular Approval 12/2018 Offered: Spring 2020</td>
</tr>
<tr>
<td>Summer</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
</tbody>
</table>

Table 1. Sample 16-month program
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<tr>
<th>Semester</th>
<th>Example 2 (12-months)</th>
<th>Status of course</th>
<th>Example 3 (9-months)</th>
<th>Status of course</th>
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<td>Summer</td>
<td>HTHRHSC 5100: <em>Introduction to Assistive Technology</em></td>
<td>Curricular Approval 12/2018 Offered: Summer 2020</td>
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<tr>
<td>Autumn</td>
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<td>Curricular Approval 12/2018 Offered: Autumn 2020</td>
<td>HTHRHSC 5100: <em>Introduction to Assistive Technology</em> Computers, Communications and Controls</td>
<td>Curricular Approval 12/2018 Offered: Autumn 2020</td>
</tr>
</tbody>
</table>

Table 2. Sample program for 12-month and 9-month programs
Comparison to other universities/programs

We identified 23 programs in the United States that currently provide a credential in assistive technology. The award level for these programs ranged from individual training courses and non-degree certificate programs to graduate degree programs. The programs included 8 graduate certificate programs, 3 post-baccalaureate certificate programs, 3 certificate programs, 3 graduate degree programs, 3 programs that provide training courses, and 3 miscellaneous programs. The programs utilize both on-line and in-person courses. A listing of the Colleges and Universities can be found in Appendix A.

Input from outside groups (i.e., accrediting body)

There is an overall need for professionals working in the field of assistive technology. The need has been documented in the literature. One of the early textbooks that identified the need was “Enabling America”[6]. The need for the development of educational centers and departments that focus on assistive technology are documented in a single issue of Technology and Disability in 2000[7]–[14]. The authors of this issue document the progression of their educational programs, with a focus on graduate education. In the meantime, the field of assistive technology has grown, partially due to the increased numbers of individuals with disabilities, but also due to the increased focus on assistive technology in the school system over the past 20 years. In response to the demand for assistive technology devices and services, RESNA developed the Assistive Technology Professional (ATP) certification in 1996, the Seating and Mobility Specialist (SMS) certification in 2010, and the Rehabilitation Engineering and Assistive Technology Education (RATE) Accreditation in 2017. The development of the ATP and SMS certifications, and the RATE accreditation has created the opportunity for educational programs to train individuals with the explicit goal of attaining the ATP and SMS certifications. The RATE accreditation provides a clear pathway for educational programs, which will guide the development of the AT certification program. The RATE accreditation will signal to potential students that the OSU ARTC program is a top tier educational program. Though we are not ready to apply for accreditation, this is our long-term goal.

The assistive technology industry has exploded as a result of the increase in the number of individuals with disabilities, the increase in older adults aging into a disability, and the inclusion of accessibility features in consumer products (e.g. Swype, Voice Over). However, a gap exists in the number of qualified professionals working in AT or RT. In the manufacturing sector, engineers, designers and sales representatives lack the skills, knowledge and experience to develop and integrate technology that meets the unique needs of individuals with disabilities. Vendors that sell assistive technology (e.g. wheelchairs, automobile modifications) often cannot find technicians with clinical skills, or clinicians with the technical skills. In the primary, secondary and postsecondary education settings, there is a need for educators, clinicians, technicians and engineers to provide assistive technology services and devices to students with disabilities. The educators and clinicians need technical skills, while technicians and engineers need educational and clinical skills in order to best address the needs of students with disabilities. Employers must spend significant resources to train new and current employees. Therefore, there is a need for an interprofessional program that not only provides
undergraduate, graduate and post-professional students the foundational education in assistive
technology, but also provides them with an interprofessional experience that prepares them for
a career in assistive technology.

Exit criteria
In order to exit the program successfully, students must receive a passing grade of all
required courses and fulfill all requirements.

Adequate Enrollment

We anticipate three types of students will enroll in the ARTC Program: non-degree
seeking students, undergraduate students enrolled at OSU, and graduate students enrolled at
OSU. The largest cohort, and primary focus of the certificate program, includes non-degree
seeking students who want to specialize in assistive technology (Academic Certificate Program
Categories 3a and 5a). The cohort of non-degree seeking students includes post-professional
students from the fields of engineering, occupational therapy, physical therapy, rehabilitation
counseling, special education and speech-language pathology. This cohort also includes current
assistive technology professionals who are interested in continuing education opportunities and
aspiring assistive technology professionals who are interested in completing the requirements
for the RESNA Assistive Technology Professional (ATP) Certification or the RESNA Seating
and Mobility Specialist (SMS) Certification. A smaller cohort of students includes those enrolled
in undergraduate programs who want to become a rehabilitation technician, a rehabilitation
technologist or a rehabilitation engineer (Academic Certificate Program Category 2). At OSU
we anticipate that the undergraduate students will complete the certificate program in addition to
their primary degree program (e.g. health sciences, speech & hearing sciences, biomedical
engineering, mechanical engineering). Finally, a small cohort of students enrolled in the
graduate program will want to specialize in assistive and rehabilitative technology. At OSU we
anticipate that the graduate students will come from the School of Health and Rehabilitation
Sciences (athletic training, occupational therapy, physical therapy) (Academic Certificate
Program Category 3a). The interprofessional nature of assistive technology will allow us to
recruit a wide range of non-degree seeking students who are not currently enrolled at OSU, and
create an opportunity to utilize online education to meet the needs of the students.

Projected enrollment (include justification for estimate)
We anticipate a potential enrollment of 150-200 non-degree seeking students and 20-30
degree seeking students per year by the 5th year of the program. The detailed estimates are
described in Table 3. We anticipate 100 to 150 post-professional non-degree seeking students
from the fields of engineering, occupational therapy, physical therapy, rehabilitation counseling,
special education and speech-language pathology. These students may take the entire
sequence of courses in order to attain the ARTC and then sit for the ATP and/or SMS exams, or
may take individual courses in order to meet their continuing education requirements. We
anticipate 40 non-degree seeking students who currently have the ATP Certification and want
continuing education credit. They will probably not complete the ARTC, but will be interested in
individual courses as part of their continuing education requirements. Finally, we anticipate 20
non-degree seeking students who are specifically seeking the ATP certification in order to become a rehabilitation technician or rehabilitation technologists. In terms of degree-seeking students, we anticipate 20-30 undergraduate and graduate students from OSU. These are students who will complete the certificate program in addition to their primary degree program. The assumed percentage of potential students from engineering is lower than HRS or SHS because they have very few opportunities for taking non-technical electives. The case-mix of undergraduate and graduate students from OSU, post-professional students, and ATPs (current and new) minimizes our risk in meeting enrollment goals. Given the broad case-mix, a strong marketing and communication plan will be critical to the success of the online program.

<table>
<thead>
<tr>
<th>Category</th>
<th>Total #</th>
<th>Assumption</th>
<th>Potential Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRS Health Science - Undergrad</td>
<td>700</td>
<td>2%</td>
<td>14</td>
</tr>
<tr>
<td>HRS Grad (PT/OT/AT)</td>
<td>150</td>
<td>2%</td>
<td>3</td>
</tr>
<tr>
<td>SHS Undergrad</td>
<td>320</td>
<td>2%</td>
<td>6</td>
</tr>
<tr>
<td>SHS Grad</td>
<td>63</td>
<td>2%</td>
<td>1</td>
</tr>
<tr>
<td>BME &amp; ME Undergrad &amp; Grad</td>
<td>300</td>
<td>1%</td>
<td>3</td>
</tr>
<tr>
<td>Post-Professional</td>
<td>1,313,960</td>
<td>0.01%</td>
<td>131</td>
</tr>
<tr>
<td>ATP (current)</td>
<td>4000</td>
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<td>40</td>
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<tr>
<td>ATP (new)</td>
<td>200</td>
<td>10%</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>256</td>
</tr>
</tbody>
</table>

Table 3: Projected enrollment in the ARTC Program
Note 1: Post-professional students include OT, PT, SLP, Special Education, Rehabilitation Counselors, and Engineers. Data based on the US Bureau of Labor Statistics from 2016.
Note 2: The ATP (current) and ATP (new) are based on 2016 numbers from RESNA. There is a turnover rate of ~200 on an annual basis.

Program Learning Outcomes

Undergraduate Academic Certificate Program: Post Bachelor Degree – Category 2
Undergraduate students in the engineering, health science, rehabilitation counseling, education or speech and hearing science programs.

1. Students will be able to identify the characteristics of individuals with disabilities.
2. Students will be able to use assistive and rehabilitative technology devices.
3. Students will be able to distinguish among assistive and rehabilitative technology devices.
4. Students will be able to recognize the assistive technology service delivery process.
5. Students will be able to discuss the assistive technology design process.
6. Students will be able to illustrate of the Human, Activity, Assistive Technology model.
7. Students will be able to define the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.
8. Students will be able to appraise emerging technologies in assistive and rehabilitative technology.

Graduate Academic Certificate Program: Post Bachelor Degree – Category 3a
Graduate students in the health sciences (e.g. Occupational Therapy, Physical Therapy), engineering, rehabilitation counseling, or education programs, or non-degree seeking professionals who have the ATP or SMS certifications.

1. Students will be able to identify the characteristics of individuals with disabilities.
2. Students will be able to analyze the unique needs of children, adults, and older adults living with a disability.
3. Students will be able to compare assistive and rehabilitative technology devices.
4. Students will be able to apply assistive and rehabilitative technology devices.
5. Students will be able to illustrate the assistive technology service delivery process.
6. Students will be able to employ the assistive technology design process.
7. Students will be able to generate a case study based on the Human, Activity, Assistive Technology model.
8. Students will be able to assess the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.
9. Students will be able to evaluate emerging technologies in assistive and rehabilitative technology.
10. Students will be able to synthesize multiple technologies for a comprehensive assistive technology solution to meet the needs of an individual.
11. Students will be able to select appropriate outcome measures and performance measures.

Technician / Professional Certification Program – Category 5a
Non-degree seeking professionals who are aspiring to get the ATP and SMS certifications

1. Students will be able to identify the characteristics of individuals with disabilities.
2. Students will be able to define the general categories of assistive and rehabilitative technology devices.
3. Students will be able to distinguish among assistive and rehabilitative technology devices.
4. Students will be able to recognize the assistive technology service delivery process.
5. Students will be able to discuss the assistive technology design process.
6. Students will be able to recognize the Human, Activity, Assistive Technology model.
7. Students will be able to define the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.

8. Students will be able to give examples of emerging technologies in assistive and rehabilitative technology.

Based on the program goals and learning outcomes, students will be positioned to advance their careers at the intersection of technology for individuals with disabilities. The intersection will transcend technologies: from consumer products designed for the general population to assistive and rehabilitative technology designed specifically for individuals with disabilities.

Employers will seek these students because of their ability to design and integrate technology for individuals with disabilities. Currently, employers have to train technical students (e.g. engineers) on the ergonomics, biomechanics and human factors applied to individual with disabilities, or they have to train health science and education students on the design and integration of technology for individuals with disabilities. The coursework in the certificate program will meet the educational requirements for the ATP and SMS certification. This certificate program will fill that gap through an interprofessional education model, thereby specifically meeting the requirements of future employers.

The goal of the non-degree seeking student will depend on their level of education and their current employer. For example, a technician for a wheelchair supplier may want the certificate in order to gain promotion within their organization to the position of technologist (aka rehabilitation technology supplier). The ATP certification is required by Medicare and some Medicaid programs to provide high-end wheelchairs. On the other hand, a clinician may want the certificate in order to gain continuing education credit, obtain a promotion within their organization, set themselves apart from their peers, and make it easy for consumers and other assistive technology specialists to recognize them as someone that specializes in assistive technology. The goal of the undergraduate student will be to obtain employment upon graduation from their primary program (e.g. manufacturer, supplier/vender), apply for a graduate professional program (e.g. MD, OTD, DPT, SLP), or apply for a graduate degree program (e.g. MS, PhD). The certificate will set them apart among their peers as they seek employment, typically as a clinician, educator or engineer.

The goal of the graduate student is to differentiate themselves among their peers as they seek employment, typically as a clinician, educator or engineer.

Opportunities for graduates
The opportunities are three-fold for graduates of the assistive technology certification program. These opportunities include employment opportunities, graduate school opportunities and job promotion/transition opportunities.

Minimum requirements to undertake program of study; admissions policy
The student must have one of the following minimum requirements in order to enroll in the assistive technology certificate program and complete 5000 level courses for undergraduate credit.
1. Associates degree in the health sciences, education, or engineering technology
2. Enrollment in a bachelor degree granting program in health sciences, education, or engineering
3. Bachelor’s degree in programs besides health sciences, education or engineering.

The student must have one of the following minimum requirements in order to enroll in the assistive technology certificate program and complete 5000 level courses for graduate credit.
1. Enrollment in a graduate degree granting program in health sciences, education, or engineering
2. Undergraduate degree in health sciences, education, or engineering.

Program Assessment
The program assessment will be consistent with the School of Health and Rehabilitation Sciences school assessment plan, already in place. Students will be additionally assessed using a post-completion survey that is included in Appendix C.

Resources
We anticipate that we will need 0.55 FTE clinical faculty position and 0.15 administrative assistant position to initiate the certificate program. The clinical faculty position will have 0.45 FTE for teaching responsibilities (15 credits) and 0.10 FTE for program coordination of the AT Certificate Program. We will leverage existing faculty within the School of Health and Rehabilitation Sciences and the Department of Speech and Hearing Sciences to develop and implement the courses. We will leverage an existing faculty member and an existing administrative assistant within the HRS for administration of the AT Certificate program. We will leverage assistive technology device manufacturers, distributors and suppliers for access to technology for online experiential learning. We will include clinicians, educators and individuals with disabilities to provide first-person experiences. Finally, the program coordinator will develop and implement programming, develop online modules, and administer the program.

Initially, we will focus on lecture-based content in order to deliver content to the broadest audience possible. In future iterations of the certificate program, we will develop hands-on components as part of the on-line content, with the expectation that the students will be able to complete the hands-on component in the local setting. This will require collaboration with manufacturers and assistive technology service delivery programs (e.g. rehabilitation center, schools) and resource centers (e.g. tech acts). Eventually, we will develop labs as electives for the certificate program. We will locate the labs both on the OSU campus (local), and in remote locations in collaboration with community partners (e.g. manufacturers, distributors, suppliers, clinics and resource centers). The local labs will be designed for students who are currently enrolled on the Columbus campus, though they will be open to any student that wants to travel to Columbus. The remote labs will allow us to greatly expand our reach and will provide us with an opportunity for developing innovation in the ARTC program curriculum. Based on our
experiences, the hands-on labs tend to be more resource intensive than lectures, therefore we will revisit the need for adequate resources (personnel, equipment and space) prior to initiating the labs.

Demand

Demand for this program has been described by the business community, professionals in the field of assistive technology, faculty and students. The assistive technology business community is continuously looking for technicians, technologist and engineers with a clinical background, and clinicians with a technology background. The business community includes manufacturers, suppliers, school districts and rehabilitation centers (inpatient and outpatient). The demand is due to the increasing age of current rehabilitation technicians, technologists and engineers, and due to the increasing numbers of individuals with disabilities. A paucity of academic programs are in place to provide a pathway for the next generation of rehabilitation technicians, technologists and engineers. An AT Certificate program is necessary to replace retiring professionals and to meet the technological needs of individuals with disabilities.

Professionals in the field of assistive technology are constantly looking for continuing education courses in order to maintain their credentials (e.g. licensing, certification). Faculty within OSU acknowledge that there is a need for integrating technology into the lives of individuals with disabilities, and that this program would directly address a gap in the curriculum. Finally, students are seeking to leverage technology with real-world application in their academic programs. The assistive technology certificate program provides an opportunity for degree-seeking students to integrate technology into their primary academic program, and provides non-degree seeking students with the opportunity to apply the coursework into their daily practice. An interprofessional cohort of non-degree seeking and degree seeking students creates an environment where non-degree seeking students can provide real-world case studies, and degree seeking students can leverage knowledge and skills obtained in other courses. The interprofessional education will increase demand for the assistive technology certificate program through organic growth (word-of-mouth) and traditional marketing to students through undergraduate programs, graduate programs and ODEE.

As identified by a review of known assistive technology, rehabilitation technology and rehabilitation engineering university-based programs, there are few programs addressing assistive technology through a certificate programs. This would be the first program of its kind within The Ohio State University. We will leverage existing relationships within the School of Health and Rehabilitation Sciences, and the Departments of Biomedical Engineering, Mechanical and Aerospace Engineering, and Speech and Hearing Sciences to create synergistic relationships that will benefit students, staff and faculty. Most importantly, the interdisciplinary students who complete the interprofessional assistive technology certificate program will be prepared to improve the quality of life of individuals with disabilities through the application of science and technology.
Within the State of Ohio, the only academic program that addresses assistive technology is Bowling Green State University. Bowling Green State University has an online Assistive Technology Certificate Program for graduate students that focuses on the application of assistive technology in the classroom. Ashland University has a partnership with OCALI to utilize OCALI’s Assistive Technology Internet Modules (ATIM) as the core component of an online graduate course. Nationally, we identified 23 university-based programs based on a search administered by EduVentures and a review of the RESNA website. Given the paucity of programs nationally, the demand for educational pathways in the field of assistive technology, and large number of potential students, there is a need for an assistive technology certificate program at The Ohio State University.

Competitiveness with other Institutions:

As noted previously, we identified 23 programs in the United States that currently provide a credential in assistive technology. Overall, there is a lack of data on these programs because of the newness of the programs. We anticipate three types of students will enroll in the ARTC Program: non-degree seeking students, undergraduate students enrolled at OSU, and graduate students enrolled at OSU. The largest cohort, and primary focus of the certificate program, includes non-degree seeking students who want to specialize in assistive technology. We anticipate that a smaller cohort of students at OSU will take these courses as electives, therefore the students will maintain their status in their home program (e.g. health sciences, engineering, speech and hearing). In terms of competing with other programs nationally, there are relatively few online certificate programs. Finally, it is important to note that three universities have attained the Rehabilitation Engineering and Assistive Technology Education Accreditation from RESNA. The three universities are the University of Illinois - Chicago, the University of Pittsburgh, and the University of Wisconsin-Milwaukee. All three are part of graduate programs with the goal of providing an MS degree. Though they are not currently direct competitors, we anticipate that some students will be attracted to the programs because of their accreditation status. Given the paucity of programs in the State of Ohio, regionally and nationally, the assistive technology certificate program is positioned to meet the needs of students interested in the field of assistive technology. The greatest challenge will be making students aware of the field, as it is a relatively new field, and is not well known to undergraduate and graduate students. We have an opportunity to leverage two trends among current and future students: working directly with individuals, in this case individuals with disabilities, and leveraging technology to improve the quality of life of individuals.
References

Appendix A

1. Bowling Green State University
   a. Online Master of Education in Special Education with a Specialization in Assistive Technology
   b. Assistive Technology Certificate
2. California State University-Dominquez Hills
   a. Certificate Program Assistive Technology Specialist
3. California State University-Northridge
   a. AT Training Program
   b. MS in Assistive Technology and Human Services (ATHS)
   c. MS in Assistive Technology and Engineering (ATE)
4. California State University-San Diego
   a. Certificate in Rehabilitation Technology
5. Illinois Institute of Technology
   a. Certificate in Rehabilitation Engineering Technology
6. Northern Arizona University
   a. Interdisciplinary Certificate Program in Assistive Technology
7. Rutgers University
   a. Graduate Program in Biomechanics and Rehabilitation Engineering
8. Southern Connecticut State University
   a. M.S. with a concentration in Assistive Technology
9. State University of New York, Buffalo
   a. Advanced Graduate Certificate Program in Assistive and Rehabilitation Technology
10. Stony Brook School of Health Technology and Management
    a. Ph.D. in Health and Rehabilitation Sciences
11. University of Denver
    a. Assistive Technology Partners/Department of Bioengineering
12. University of Illinois at Chicago
    a. Assistive Technology Certificate Program
    b. MS in Disability and Human Development
13. University of Kentucky
    a. Assistive Technology Graduate Programs
14. University of Michigan
    a. Undergraduate Program in Rehabilitation Engineering
    b. Graduate Program in Ergonomics and Rehabilitation Engineering (better website: https://medicine.umich.edu/dept/pmr/programs/rehabilitation-engineering)
15. University of New Hampshire
    a. Graduate Certificate in Assistive Technology
16. University of Pittsburgh
    a. Certificate in Assistive Technology
    b. MS in Health and Rehabilitation Sciences with a concentration in Rehabilitation Science and Technology
17. University of Pittsburgh
    a. Rehabilitation Science and Technology Continuing Education
18. University of Wisconsin-Milwaukee
    a. Assistive Technology and Accessible Design Certificate Program
19. University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute
    a. Training and Online Classes
20. Programs in Canada
   a. University of Toronto - NSERC CREATE CARE
   b. Biomedical Engineering Programs in Canada

21. Programs in the United Kingdom
   a. University College London - MSc in Rehabilitation Engineering and Assistive Technologies
Appendix B

HTHRHSC 5100: Introduction to Assistive Technology (3 credits) – Instructor: Carmen DiGiovine
Students learn how to develop and implement comprehensive assistive technology (AT) interventions for individuals with disabilities and older adults. Students achieve competency in evaluating clients’ technology needs and providing recommendations for appropriate assistive technology and environment modifications to maximize function for individuals living with disability. Students also achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on evidence based practice. The course addresses both the pediatric and adult population for the development of AT service delivery skills and knowledge. The course includes information on disability, computer access/technology, alternative and augmentative communication, electronic cognitive devices, driver’s rehabilitation, low vision technologies, seating and wheeled mobility, electronic activities of daily living, and home automation. The unique needs of children, adults, and older adults are addressed in the home, school, community and vocational settings. This course begins to lay the foundation for an individual interested in the successful completion of the ATP examination.

HTHRHSC 5400: Computers, Communication and Control for Individuals with Disabilities (3 credits) – Instructor: Carmen DiGiovine
Students learn how to integrate consumer electronics and assistive technologies for individuals with disabilities and older adults. Students will learn about computer access & technologies, communication devices and devices designed to control the environment. In terms of consumer electronics this includes smartphones, tablets, computers and the internet of things. In terms of assistive technology this includes augmentative and alternative communication, electronic cognitive devices, electronic aids to daily living (aka environmental control units), and accessible user interface hardware and software for computers. The student will integrate these technologies across devices, contexts, settings, activities, and individual characteristics (e.g. capacity and performance). The student will learn about methods for evaluating emerging assistive technology as it relates to computers, communication and control of the environment. Finally, the student will be able to identify key concepts of universal design and engineering design processes. This course builds on the foundation developed in an HTHRHSC 5100: Introduction to Assistive Technology, and provides specific content material necessary for the successful completion of the ATP examination.
HTHRSC 5200: Assistive Technology for Seating and Mobility (3 credits) – Instructor: Carmen DiGiovine

Students are introduced to the concepts of seating and mobility for individuals with disabilities and older adults. Student will learn about the different types of mobility devices, ranging from canes, crutches and walkers, to wheelchairs and scooters. They will also learn about different seating systems, ranging from generic planar systems to custom molded systems. They will learn the different types of devices, the purpose for each device, and the appropriate application for each device. Students will achieve competency in understanding methods for assessing capacity and performance while using a mobility device, which includes set-up, configuration and programming. The student will apply the AT service delivery process as it applies to seating and mobility. The course provides the foundation for participation in an interprofessional team focused on seating and mobility, which can be used in industry, research, clinical practice or education. This course builds on the foundation developed in an HTHRSC 5100: Introduction to Assistive Technology, and provides specific content material necessary for the successful completion of the ATP and Seating and Mobility Specialist (SMS) examinations.

HTHRSC 5450: Assistive Technology for Sports and Recreation (3 credits) – Instructor: Carmen DiGiovine

Students are introduced to the concepts of adapted sports and recreation for individuals with disabilities and older adults. The course will provide a historical overview of sports and recreation for individuals with disabilities from the inception of wheelchair sports to the development of Paralympics and accessible electronic games. The student will learn about the overlap between sports and recreation and assistive technology in terms of devices, the service delivery process, and strategies for inclusion. The students will learn about methods for evaluating adapted sports and recreation technology in terms of safety and application. As adaptive sports and recreation technology is often emerging based on a specific application, we will apply key concepts of universal and engineering design to identify appropriate application of the technology. The course provides the foundation for participation in an interprofessional team focused on sports and recreation, which can be used in industry, research, clinical practice or education. This course builds on the foundation developed in an HTHRSC 5100: Introduction to Assistive Technology, and provides specific content material necessary for the successful completion of the ATP examinations.
Appendix C

Undergraduate Stand-Alone Certificate Program Assessment

School of Health and Rehabilitation Sciences

Assistive and Rehabilitative Technology Certificate (ARTC)
(Undergraduate Stand-Alone Certificate Type 2)

By completing the Assistive and Rehabilitative Technology Certificate (ARTC) Program...

1. I am able to identify the characteristics of individuals with disabilities.

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
<th>Completely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

2. I am able to use assistive and rehabilitative technology devices.

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
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</table>

3. I am able to distinguish among assistive and rehabilitative technology devices.

<table>
<thead>
<tr>
<th>Completely Disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
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</table>

4. I am able to recognize the assistive technology service delivery process.

<table>
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<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
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<td></td>
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5. I am able to discuss the assistive technology design process.

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<tr>
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<th>Agree</th>
<th>Completely Agree</th>
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</thead>
<tbody>
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6. I am able to illustrate of the Human, Activity, Assistive Technology model.

<table>
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<th>Disagree</th>
<th>Neither Agree or Disagree</th>
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<tbody>
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<td></td>
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7. I am able to define the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.

<table>
<thead>
<tr>
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<th>Disagree</th>
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8. I am able to appraise emerging technologies in assistive and rehabilitative technology.

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<tr>
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<th>Disagree</th>
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Graduate Stand-Alone Certificate Program Assessment

School of Health and Rehabilitation Sciences

Assistive and Rehabilitative Technology Certificate (ARTC)  
(Graduate Stand-Alone Certificate Type 3a)

By completing the Assistive and Rehabilitative Technology Certificate (ARTC) Program…

1. I am able to identify the characteristics of individuals with disabilities

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2. I am able to analyze the unique needs of children, adults, and older adults living with a disability

<table>
<thead>
<tr>
<th>Completely Disagree</th>
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<th>Neither Agree or Disagree</th>
<th>Agree</th>
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3. I am able to compare assistive and rehabilitative technology devices.

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4. I am able to apply assistive and rehabilitative technology devices.

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5. I am able to illustrate the assistive technology service delivery process.

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6. I am able to employ the assistive technology design process.

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7. I am able to generate a case study based on the Human, Activity, Assistive Technology model.

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8. I am able to assess the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.

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9. I am able to evaluate emerging technologies in assistive and rehabilitative technology.

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10. I am able to synthesize multiple technologies for a comprehensive assistive technology solution to meet the needs of an individual.

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<th>Neither Agree or Disagree</th>
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11. I am able to select appropriate outcome measures and performance measures.

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By completing the Assistive and Rehabilitative Technology Certificate (ARTC) Program…

1. I am able to identify the characteristics of individuals with disabilities.

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2. I am able to define the general categories of assistive and rehabilitative technology devices.

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3. I am able to distinguish among assistive and rehabilitative technology devices.

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4. I am able to recognize the assistive technology service delivery process.

<table>
<thead>
<tr>
<th>Completely Disagree</th>
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<th>Neither Agree or Disagree</th>
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5. I am able to discuss the assistive technology design process.

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</table>
6. I am able to recognize the Human, Activity, Assistive Technology model.

<table>
<thead>
<tr>
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<th>Neither Agree or Disagree</th>
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7. I am able to define the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.

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8. I am able to give examples of emerging technologies in assistive and rehabilitative technology.

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Appendix D

The School of Health and Rehabilitation Sciences

Assistive Rehabilitative Technology Certificate (ARTC)

The School of Health and Rehabilitation Sciences (SHRS) is a School in The Ohio State University College of Medicine. The School is nationally recognized as a leader in practice-based health care education. For more than five decades, the School has prepared students to achieve personal and professional excellence, as they pursue an exciting career in healthcare.

PROGRAM OVERVIEW

The purpose of the ARTC program is to educate health science, engineering, rehabilitation counseling and education professionals on the application of science and technology for improving the quality of life of individuals with disabilities.

The curriculum is designed to prepare undergraduate, graduate and post-professional students for the Assistive Technology Professional and the Seating and Mobility Specialist certifications, which are administered by the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA). Graduates of the ARTC program will be well positioned for employment opportunities within the fields of assistive technology, accessibility customer service, and rehabilitation technology, graduate school opportunities (clinical and research), and job promotion/transition opportunities.

The ARTC program includes four courses: an introductory course and three specialty courses. Students will need to complete all four courses in order to successfully attain the certificate.

ADMISSION & APPLICATION PROCEDURES

Applicants for the ARTC certificate must meet the following minimum requirements and submit requested materials to be considered for admission.

Undergraduate Academic Certificate Program

- Currently enrolled in undergraduate program.

Graduate Academic Certificate Program

- Currently enrolled in graduate program, or
- Completed graduate program, or
- Undergraduate degree with RESNA ATP certification.

Technician / Professional Certification Program

- Associate degree in health sciences, education, engineering, technology or consent of the program director.

An electronic application is available online at XXX which must be completed and submitted with all required supplemental documents, if applicable.

CERTIFICATE REQUIREMENTS

The minimum total hours to receive the ARTC is the completion of all four required courses (12 credit hours) outlined below.

CURRICULUM (12 SEMESTER HOURS)

The curriculum is completed in any order and all courses are offered online.

SUGGESTED SCHEDULING PLAN

The following plan demonstrates how students may complete the certificate in two semesters. There is much flexibility in when a student may take courses.

- HTHRHSC 5100: Introduction to Assistive Technology
- HTHRHSC 5200: Assistive Technology for Seating and Mobility
- HTHRHSC 5400: Computers Communication and Controls for Individuals with Disabilities
- HTHRHSC 5450: Assistive Technology for Sports and Recreation
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<th>Sample 1</th>
<th>Sample 2</th>
<th>Sample 3</th>
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<tr>
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<td>HTHRHSC 5100: Introduction to Introduction Assistive Technology</td>
<td>HTHRHSC 5100: Introduction to Introduction Assistive Technology</td>
<td>HTHRHSC 5400: Computers, Communications and Controls for Individuals with Disabilities</td>
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<td>Autumn</td>
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<td>HTHRHSC 5400: Computers, Communications and Controls for Individuals with Disabilities</td>
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*The program will give individual consideration in the admission assessment to courses taken and applicant experiences.

**ADDITIONAL INFORMATION**

It is strongly recommended that prospective students schedule an appointment with an advisor in SHRS Student Services or the certificate advisor.

Student Services Office
School of Health and Rehabilitation Sciences
Carmen DiGiovine, PhD, ATP/SMR, RET
Director, Rehabilitation Science and Technology-Assistive Technology Center

206 Atwell Hall
453 West 10th Avenue
Columbus, Ohio 43210
614-292-1706
HRSSA@osumc.edu

406 Atwell Hall
453 W. 10th Avenue
Columbus, Ohio 43210
614-293-7876
carmen.digiovine@osumc.edu

The School of Health and Rehabilitation Sciences
Appendix E
(SAMPLE CERTIFICATE COMPLETION SHEET)

School of Health and Rehabilitation Sciences

Assistive and Rehabilitative Technology Certificate (ARTC)
(Undergraduate Stand-Alone Certificate Type 2)

STUDENT NAME:

____________________________________________________________________

STUDENT OSU EMAIL:

____________________________________________________________________

CERTIFICATE ADVISOR NAME:

____________________________________________________________________

REQUIRED COURSES (12 HOURS)

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CERTIFICATE ADVISOR SIGNATURE ____________________________________________
(SAMPLE CERTIFICATE COMPLETION SHEET)

School of Health and Rehabilitation Sciences

Assistive and Rehabilitative Technology Certificate (ARTC)
(Graduate Stand-Alone Certificate Type 3a)

STUDENT NAME:

STUDENT OSU EMAIL:

CERTIFICATE ADVISOR NAME:

REQUERED COURSES (12 HOURS)

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CERTIFICATE ADVISOR SIGNATURE ________________________________
(SAMPLE CERTIFICATE COMPLETION SHEET)

School of Health and Rehabilitation Sciences

Assistive and Rehabilitative Technology Certificate (ARTC)
( Technician Professional Certificate Type 5a )

STUDENT NAME:

________________________________________________________

STUDENT OSU EMAIL:

________________________________________________________

CERTIFICATE ADVISOR NAME:

________________________________________________________

REQUIRED COURSES (12 HOURS)

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CERTIFICATE ADVISOR SIGNATURE __________________________________________
**NEW COURSE REQUEST FORM**

**Submission Date:** 11/15/2018

### General Information

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<th><em>Course Title:</em></th>
<th>Introduction to Assistive Technology (Max 100 Characters)</th>
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<th>(Max 18-Characters)(This is what will show up on the student’s transcript for the course)</th>
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Students learn how to develop and implement assistive technology (AT) devices and services. The course includes information on disability, computer access/technology, alternative and augmentative communication, electronic cognitive devices, driver’s rehabilitation, low vision technologies, seating and wheeled mobility, electronic activities of daily living, and home automation.

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<th>-OR-</th>
<th>_______Variable</th>
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### Offering Information

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<th>_______7 Week</th>
<th>_______14 Week</th>
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*If yes, is any section of the course offered... (Note: check all that apply)*

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<td>Less than 50% at a distance?</td>
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<td>Progress – Letter</td>
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*If Yes, state:___
Maximum number of credit hours / units allowed ______
Maximum number of separate course completions allowed ______
Whether to allow multiple enrollments in a term  Select One

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<td>Independent Study</td>
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*Credit Available by Exam  No
*If yes, select exam type (Note: check all that apply)
  Advanced Placement Program (AP)
  College Level Examination Program (CLEP)
  Departmental Exam
  EM Tests via university Office of Testing
  International Baccalaureate

*Off Campus  Always

*Campus Offering (Check all that Apply):  X_Columbus  LIMA  other – which one(s)?

Prerequisites and Exclusions
*Prerequisites/Co-requisites  Max 500 Characters (Write out prerequisites here!)
Prerequisites:  3rd year standing or greater
EEOB 2520 or Physio 3102, or equivalent, Psychology 1100 or equivalent; Or by consent of the instructor
*Exclusions  None
Max 500 Characters (Write any exclusions here (quarter equivalencies, etc.))

Cross-Listings
*Cross-Listings  None
Max 250 Characters (Will your course be cross listed with any other course? If so, which one(s)?)

Subject/CIP Code
*Subject/CIP Code  51.2312 (Note: search <http://nces.ed.gov/ipeds/cipcode/> for list of options)

*Subsidy Level  Doctoral  *Must match highest intended rank

*Intended Rank (Check all that apply)
  Freshman
  Sophomore
  X_Senior
  X_Junior
  X_Masters
  Professional
  XX_Doctoral

*Requirement/Elective Designation (Note: check all that apply)
**Course Goals or Learning Objectives/Outcomes (knowledge, skills, and attitudes/perspectives)**

1. Students will gain a general understanding of technology.
2. Students will gain an understanding of disability.
3. Students will understand the interaction between technology and individuals with disabilities.
4. Students will understand the framework of assistive technology, services, devices, strategies, and practices.

**Content Topic List**

- Introduction to Assistive Technology
- Framework for Assistive Technologies
- Disability
- Seating Systems
- User inputs
- Control interfaces
- Computer Access
- Sensory Aids for Persons with Visual Impairments
- Sensory Aids for Persons with Auditory Impairments
- Electronic Cognitive Devices
- Augmentative and Alternative Communication
- Technologies that Enable Mobility
- Technologies for Transportation and Driving
- Technologies that Aid Manipulation and Control of the Environment

**Approval Signatures**

**Faculty Member Course Initiator:**

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**Department/Division Director:**

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**Curriculum Chair:**

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**Graduate Studies Committee Chair:**
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**Academic Unit Chair/School Director:**

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**Honors (if appropriate):**

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</table>
Course number: HTHRHSC 5100
Instructor: Carmen P. DiGiovine, PhD, ATP/SMS, RET
Phone number: 614.293.7876 (DiGiovine)
E-mail: digiovine.1@osu.edu
Office Location: 406 Atwell Hall
Graded: OSU Standard Grading
Format: Online
Credit Hours: 3 hours
When Taught: TBD
Office Hours: TBD

Course Description:
Students learn how to develop and implement assistive technology (AT) devices and services. Students achieve competency in evaluating clients’ technology needs and providing recommendations for appropriate assistive technology to maximize function for individuals living with disability. Students also achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on evidence based-practice. The course addresses both the pediatric and adult population for the development of AT devices and services. The course includes information on disability, computer access/technology, alternative and augmentative communication, electronic cognitive devices, driver’s rehabilitation, low vision technologies, seating and wheeled mobility, electronic activities of daily living, and home automation. The unique needs of children, adults, and older adults are addressed in the home, school, community and vocational settings. This course begins to lay the foundation for an individual interested in the successful completion of the RESNA Assistive Technology Professional (ATP) certification.

Required Text (UG & Grad):

Required Articles (Grad)


**Course Goals:**
1. Students will gain a general understanding of technology.
2. Students will gain an understanding of disability.
3. Students will understand the interaction between technology and individuals with disabilities.
4. Students will have an understanding of the framework of assistive technology, services, devices, strategies, and practices.

**General Course Learning Objectives:**
At the conclusion of this course, the student will be able to:
1. Define disability.
2. Define AT in terms of devices, services, practices and strategies.
3. Discriminate among multiple AT devices.
4. Demonstrate the effective utilization of rehabilitation technology.
5. List the different types of AT devices.
6. Define the models and settings of the AT service delivery process.
7. Compare and contrast the different AT service delivery models.
8. Identify the roles of individuals who are associated with the provision of AT.
9. Demonstrate the appropriate documentation of AT services.
10. Discuss AT outcome measures.
11. Accurately represent and articulate the goals of the individual with a disability.
12. Identify potential disparities between the clinician’s goals and the individual with a disability’s goals.
13. Describe the unique needs of children, adults, and older adults living with a disability.
14. Recognize aspects of universal design.
15. Recall ethics and policies of assistive technology.

**Graduate Level Course Learning Objectives:**
1. Analyze case examples of the key milestones to acquisition of assistive technology (assessment, implementation, training and follow-up).
2. Employ evidence-based practice.
3. Illustrate the processes for the AT service delivery model.
4. Differentiate the roles of individuals who are associated with the provision of AT.
5. Analyze the unique needs of children, adults, and older adults living with a disability.
6. Synthesize multiple technologies for a comprehensive AT solution to meet the needs of an individual.
7. Compare and contrast outcome measures and performance measures.

**Assignments:**
Quizzes: Identify, define, and apply rehabilitation technology and assistive technology devices and services.
Class Participation – Compare and contrast service delivery models, assistive technologies and rehabilitation technologies.
Final Exam – Identify and recognize key components of AT services, strategies, devices and practices.

**Graduate Level Assignments (in addition to above):**
Case report(s) based on assistive technology assessment variables – Apply assistive technology service delivery process to case scenarios.
Technology Evaluation(s) based on the assistive technology device review.
Grading Policy

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Percentage</th>
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<tr>
<td>Quizzes</td>
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<td>Final Exam</td>
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Graduate Level Grading Policy

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<tr>
<td>Quizzes</td>
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<td>Class Participation</td>
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<tr>
<td>Case Reports</td>
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<td>Technology Evaluation</td>
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**Quizzes:** All quizzes will be on Carmen and will be timed. Dates of when quizzes will be open and closed will be announced. Anyone missing a quiz deadline will receive a reduction in total possible score of one letter grade per day. These will be open book quizzes. It is the student’s responsibility to report to the instructor if there are any problems during the completion of the quizzes.

**Class Participation:** Students are expected to participate in all class activities. This includes completing all assigned readings and actively participating in online discussions. Students are expected to have questions prepared based on the assigned readings. Students are expected to notify instructors as early as possible by email if they will be unable to participate in a class activity. In the event of an absence it is the student’s responsibility to complete all classwork missed.

**Case Reports (Graduate):** Case reports will be based on cases provided case studies provided by the instructor. Case reports will follow the assistive technology assessment variables template.

**Technology Evaluations (Graduate):** The assistive technology / rehabilitation technology device evaluation will follow the assistive technology device review template.

**Final Exam:** The exam will be online and open book.

**Grading Scale:**

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<td>A-</td>
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<td>65-69</td>
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<td>Below 65</td>
<td>F</td>
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**Course Policies:**
All School and Program course policies apply to this course.

**Online Structure:** This course will be conducted in a distance-learning, online format. All materials will be provided via Carmen and all assignments will be completed via Canvas file upload. All necessary materials will be provided in the content section of Carmen. A tutorial is available at [https://ocio.osu.edu/audience/students](https://ocio.osu.edu/audience/students). Notices about this course will be sent to your name.#@buckeyemail.osu.edu account. All students must have
an active OSU email account and remain electronically connected to OSU. Emails may be forwarded to an external email address. Please contact the Help Desk for more information.

Course technology: For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.

Self-Service and Chat support: http://ocio.osu.edu/selfservice • Phone: 614-688-HELP (4357) Email: 8help@osu.edu • TDD: 614-688-8743

Academic Misconduct: The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism, collaboration on assignments assigned to be independent, using the same work for more than one course, and dishonest practices in connection with examinations and quizzes. The code of student conduct defines plagiarism as “…the representation of another’s work or ideas as one’s own; it includes the unacknowledged word-for-word use and/or paraphrasing of another person’s work, and/or the inappropriate unacknowledged use of another person’s idea.” Students are expected to report to the instructor peers’ actions that they believe to represent academic misconduct.

Instructors shall report all instances of alleged academic misconduct to the committee and the committee will determine a course of action (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct [http://studentconduct.osu.edu/]. Please see SHRS Student Handbook Policy #2 - Academic Misconduct.

School and Program Handbooks: Handbooks are available on the SHRS website: hrs.osu.edu. These handbooks provide all required policies and procedures required for students accepted into academic programs in SHRS.

Disabilities: The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue

Counseling and Consultation Services:
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org

Diversity: "The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to
strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited."

**Title IX:** Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at [http://titleix.osu.edu](http://titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu.

**Grievances and Solving Problems**- Please see SHRS Student Handbook Policy # 5 – Student Appeal Process. In general, a student should meet with the instructor of record for the course first and then, as outlined in Policy #5, a student should then take any problem or grievance to the Division Director.

**Conduct in the Classroom and Academic Learning Environment**- Students will adhere to the code of student conduct for The Ohio State University at all times. Students in the School of HRS have additional professional requirements for behavior due to the nature of their professional training and the environments in which learning may occur. Please see SHRS Student Handbook Policy # 6

**Course Schedule Changes:** This syllabus, the course elements, policies, and schedule are subject to change in the event of extenuating circumstances. It is the responsibility of the student to make note of those changes as they are announced.

**Copyright**-The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

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### Weekly Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignments</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Assistive Technology</td>
<td>Chp 1 EAT [UG &amp; Grad] Andrich et al. (2013) [Grad]</td>
<td>Quiz: Intro to AT &amp; AT Framework [UG &amp; Grad]</td>
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<tr>
<td>2</td>
<td>Framework for Assistive Technologies</td>
<td>Chp 2 EAT [UG &amp; Grad]</td>
<td>Quiz: Seating Systems [UG &amp; Grad]</td>
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<td>3</td>
<td>Disability</td>
<td>Chp 3 EAT [UG &amp; Grad]</td>
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<td>5</td>
<td>User inputs</td>
<td>Chp 5 EAT [UG &amp; Grad]</td>
<td>Technology Evaluation #1 [Grad]</td>
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<tr>
<td>6</td>
<td>Control interfaces</td>
<td>Ch 6 EAT [UG &amp; Grad]</td>
<td>Quiz: Control Interfaces and User inputs [UG &amp; Grad]</td>
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<td>8</td>
<td>Sensory Aids for Persons with Visual Impairments</td>
<td>Ch 8 EAT [UG &amp; Grad]</td>
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<tr>
<td>9</td>
<td>Sensory Aids for Persons with Auditory Impairments</td>
<td>Ch 9 EAT [UG &amp; Grad]</td>
<td>Quiz: Visual and Auditory Impairments [UG &amp; Grad]</td>
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<tr>
<td>11</td>
<td>Augmentative and Alternative Communication</td>
<td>Ch 11 EAT [UG &amp; Grad] Baxter et al. (2012) [Grad]</td>
<td>Quiz: ECD &amp; AAC [UG &amp; Grad]</td>
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<tr>
<td>12</td>
<td>Technologies that Enable Mobility</td>
<td>Ch 12 EAT [UG &amp; Grad]</td>
<td>Quiz: Mobility [UG &amp; Grad] Case Report #2 [Grad]</td>
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<td>13</td>
<td>Technologies for Transportation and Driving</td>
<td>Ch 13 EAT [UG &amp; Grad]</td>
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<td>14</td>
<td>Technologies that Aid Manipulation and Control of the Environment</td>
<td>Ch 14 EAT [UG &amp; Grad] Liu et al. (2016) [Grad]</td>
<td>Quiz: EADL &amp; Computer Access</td>
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</table>

*EAT – Essentials of Assistive Technology*
**NEW COURSE REQUEST FORM**  
Submission Date: 11/15/2018

**General Information**

*EFFECTIVE TERM:* Autumn 2019

**Course Bulletin Listing/Subject Area:** Occupational Therapy

Fiscal Unit/Academic Org: D2504 - SHRS

**College/Academic Org List:** Health and Rehabilitation Sci

**Level/Career:**  
- Undergraduate
- Graduate
- Professional

**Course Number/Catalog:**  
- HTHR 5200

**Honors Designation:** Select

**Course Title:** Assistive Technology for Seating and Mobility (Max 100 Characters)

**Transcript Abbreviation:** AT for Stg & Mob (Max 18-Characters)  
(*This is what will show up on the student’s transcript for the course*)

**Course Description:** (Maximum 400 Characters for Course Bulletin)  
Students learn how to develop and implement seating and mobility devices and services. The course includes information on mobility devices including canes, crutches, walkers, manual wheelchairs, power wheelchairs, scooters and power add-on devices. The course also includes information on seating systems including seat cushions, back supports, and postural supports.

**Semester Credit Hours:**  
- Fixed  
- Variable  

**Offering Information**

**Length of Course:**  
- 4 Week (May Session)
- 7 Week
- 14 Week
- 12 Week (May + Summer)

**Flex Schedule Course:** No

*Does any section of this course have a distance education component?* Yes

*If yes, is any section of the course offered... (Note: check all that apply)*

- 100% at a distance? 
- Greater or equal to 50% at a distance? 
- Less than 50% at a distance?

**Grading Basis (Select one)**

- Letter Grade
- Satisfactory/Unsatisfactory
- Progress – S/U
- Progress – Letter

**Repeatable:** No

*If Yes, state:_
*Maximum number of credit hours / units allowed ______
*Maximum number of separate course completions allowed ______
*Whether to allow multiple enrollments in a term Select One

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<tr>
<td>_____ Clinical</td>
<td>_____ Clinical</td>
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<tr>
<td>_____ Field Experience</td>
<td>_____ Field Experience</td>
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<tr>
<td>_____ Independent Study</td>
<td>_____ Independent Study</td>
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<td>_____ Laboratory</td>
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<td>_____ Lecture</td>
<td>_____ Lecture</td>
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<tr>
<td>_____ Workshop</td>
<td>_____ Workshop</td>
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<tr>
<td>_____ Recitation</td>
<td>_____ Recitation</td>
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</tbody>
</table>

*Credit Available by Exam  No
*If yes, select exam type (Note: check all that apply)
_____ Advanced Placement Program (AP)
_____ College Level Examination Program (CLEP)
_____ Departmental Exam
_____ EM Tests via university Office of Testing
_____ International Baccalaureate

*Off Campus  Always

*Campus Offering (Check all that Apply):  ___ X___Columbus  _____LIMA  _____other – which one(s)?

Prerequisites and Exclusions
*Prerequisites/Co-requisites  Max 500 Characters (Write out prerequisites here!)
Prerequisites: 3rd year standing or greater
HTHRHSC 5XXX, or equivalent; Or by consent of the instructor
*Exclusions  None
Max 500 Characters (Write any exclusions here (quarter equivalencies, etc.))

Cross-Listings
*Cross-Listings  None
Max 250 Characters (Will your course be cross listed with any other course? If so, which one(s)?)

Subject/CIP Code
*Subject/CIP Code  51.2312 (Note: search <http://nces.ed.gov/ipeds/cipcode/> for list of options)

*Subsidy Level  Doctoral  *Must match highest intended rank

*Intended Rank (Check all that apply)
_____ Freshman  _____ Sophomore  _____ X__Senior  _____ X__Junior  X__Masters  ___ Professional
XX___ Doctoral

*Requirement/Elective Designation (Note: check all that apply)
Required for this unit’s degrees, majors, and/or minors

General Education course  *If yes, for which topic(s) does this course meet the requirements *

The course is an elective (for this or other units) or is a service course for other units

*COMMENTS: Course is offered in Autumn (List course comments here, including term(s)/session(s) when course is offered)

Course Goals or Learning Objectives/Outcomes (knowledge, skills, and attitudes/perspectives)

1. Students will gain a general understanding of technology.
2. Students will gain a general understanding of seating and mobility systems.
3. Students will understand/analyze the different types of mobility and seating components.
4. Students will understand the interaction between individuals with disabilities and their seating systems.
5. Students will understand the framework of seating and mobility, services, devices, strategies, and practices.
6. Students will understand the service delivery process for seating and mobility across multiple settings.

Content Topic List

Overview of Assistive Technology
Introduction to Seating and Mobility
Seating & Mobility Service Delivery Process
Seating and Mobility Assessment Process
Seating Systems
Manual Mobility: Independent Propeller
Manual Mobility: Dependent Propeller
Power Mobility: Overview
Power Mobility: Alternative Access Methods
Power Mobility: Optimizing Driving and Advanced Applications
Advanced Assessments & Applications in Seating and Mobility
Biomechanics of Seating and Mobility
Mobility Transportation safety
Application of Seating and Mobility: Pediatrics & Adults

Approval Signatures

Faculty Member Course Initiator:
Signature
Date 11/15/2018

Department/Division Director:
Signature
Date 11/15/2018

Curriculum Chair:
Signature
Date

Form 11/14/2013
School of Health and Rehabilitation Sciences
<table>
<thead>
<tr>
<th>Graduate Studies Committee Chair:</th>
<th>Date</th>
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<tbody>
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<th>Academic Unit Chair/School Director:</th>
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</table>
HTHRHSC 5200 Assistive Technology for Seating and Mobility

Course number: HTHRHSC 5200  
Instructor: Carmen P. DiGiovine, PhD, ATP/SMS, RET  
Phone number: 614.293.7876 (DiGiovine)  
E-mail: digiovine.1@osu.edu  
Office Location: 406 Atwell Hall  
Graded: OSU Standard Grading  
Format: Online  
Credit Hours: 3 hours  
When Taught: TBD  
Office Hours: TBD  
Prerequisite: Introduction to Assistive Technology or Instructor Approval

Course Description:
Students learn how to develop and implement seating and mobility devices and services. Students build on the assistive technology device and service delivery framework introduced in “Introduction to Assistive Technology”. Students achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on seating and mobility. Students will also achieve competency in the understanding and application of different types of mobility devices and seating systems. The course includes information on mobility devices including canes, crutches, walkers, manual wheelchairs, power wheelchairs, scooters and power add-on devices. The course also includes information on seating systems including seat cushions, back supports, and postural supports. Finally, the course will introduce the biomechanical and anthropometric aspects of seating and mobility as it relates to mobility device propulsion and seating system dynamics. This course begins to lay the foundation for an individual interested in the successful completion of the RESNA Assistive Technology Professional (ATP) certification and the Seating and Mobility Specialist (SMS) Certification.

Required Text (UG & Grad):

Required Articles (UG & Grad):
**Required Articles (Grad)**


**Recommended Text:**


**Course Goals:**

1. Students will gain a general understanding of technology.
2. Students will gain a general understanding of seating and mobility systems.
3. Students will understand/analyze the different types of mobility and seating components.
4. Students will understand the interaction between individuals with disabilities and their seating systems.
5. Students will have an understanding of the framework of seating and mobility, services, devices, strategies, and practices.
6. Students will understand the service delivery process for seating and mobility across multiple settings.

**General Course Learning Objectives:**

At the conclusion of this course, the student will be able to:

1. Define assistive technology in terms of devices, services, practices and strategies.
2. Demonstrate the effective utilization of rehabilitation technology.
3. List the different types of mobility devices.
4. Compare and contrast different types of seating and mobility equipment.
5. Identify the roles of individuals who are associated with the provision of seating and mobility equipment.
6. Demonstrate proper assessment practices (client, physical, seating, mobility, equipment, outcome measures)
7. Demonstrate appropriate documentation
8. Accurately represent and articulate the goals of the individual with a disability
9. Interpret available measurement tools for seating and mobility
10. Recognize the need and process of equipment modifications
11. Understand the integration and customization of technology within seating and mobility
12. Identify the existing/current use of equipment
13. Identify potential disparities between the clinician’s goals and the individual with a disability’s goals.
14. Describe the unique needs of children, adults, and older adults living with a disability.

Graduate Level Course Learning Objectives:
At the conclusion of this course, the graduate student will be able to:
1. Analyze case examples of the key milestones to acquisition of seating and mobility devices (assessment, implementation, training and follow-up).
2. Employ evidence-based practice.
3. Differentiate the roles of individuals who are associated with the provision of seating and mobility equipment.
4. Analyze the unique mobility needs of children, adults, and older adults living with a disability.
5. Synthesize multiple technologies for a comprehensive seating and mobility system to meet the mobility needs of an individual.
6. Compare and contrast outcome measures and performance measures.

Assignments:
Quizzes: Identify, define, and apply seating and mobility devices and services.
Class Participation – Compare and contrast service delivery models, devices and emerging technologies in seating and mobility.
Final Exam – Identify and recognize key components of seating and mobility services, strategies, devices and practices.

Graduate Level Assignments (in addition to above):
Case report(s) based on assistive technology assessment variables – Apply seating and mobility service delivery process to case scenarios.
Seating and mobility technology evaluation(s) based on the assistive technology device review.

Grading Policy

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**Graduate Level Grading Policy**

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**Quizzes:** All quizzes will be on Carmen and will be timed. Dates of when quizzes will be open and closed will be announced. Anyone missing these items will receive a reduction in total possible score of one letter grade per day. These will be open book quizzes. It is the student’s responsibility to report to the instructor if there are any problems during the completion of the quizzes.

**Class Participation:** Students are expected to participate in all class activities. This includes completing all assigned readings and actively participating in online discussions. Students are expected to have questions prepared based on the assigned readings. Students are expected to notify instructors as early as possible by email if they will be unable to participate in a class activity. In the event of an absence it is the student’s responsibility to complete all classwork missed.

**Case Reports (Graduate):** Case reports will be based on cases provided case studies provided by the instructor. Case reports will follow the assistive technology assessment variables template.

**Technology Evaluations (Graduate):** The assistive technology / rehabilitation technology device evaluation will follow the assistive technology device review template.

**Final Exam:** The exam will be online and open book.

**Grading Scale:**

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<tr>
<th>Percent</th>
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<td>77-79</td>
<td>C+</td>
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<td>90-92</td>
<td>A-</td>
<td>73-78</td>
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<td>87-89</td>
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<td>70-72</td>
<td>C-</td>
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<td>83-86</td>
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<td>80-82</td>
<td>B-</td>
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<td>F</td>
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Self-Service and Chat support: http://ocio.osu.edu/selfservice • Phone: 614-688-HELP (4357)
Email: 8help@osu.edu • TDD: 614-688-8743

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Grievances and Solving Problems- Please see SHRS Student Handbook Policy # 5 – Student Appeal Process. In general, a student should meet with the instructor of record for the course first and then, as outlined in Policy #5, a student should then take any problem or grievance to the Division Director.

Conduct in the Classroom and Academic Learning Environment- Students will adhere to the code of student conduct for The Ohio State University at all times. Students in the School of HRS have additional professional requirements for behavior due to the nature of their professional training and the environments in which learning may occur. Please see SHRS Student Handbook Policy # 6
**Course Schedule Changes:** This syllabus, the course elements, policies, and schedule are subject to change in the event of extenuating circumstances. It is the responsibility of the student to make note of those changes as they are announced.

**Copyright:** The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

**Weekly Course Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of Assistive Technology</td>
<td>Ch 1 EAT [UG &amp; Grad] Andrich et al. (2013) [Grad]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Introduction to Seating and Mobility</td>
<td>Ch 4 &amp; Ch 12 EAT [UG &amp; Grad]</td>
<td></td>
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<tr>
<td>3</td>
<td>Seating &amp; Mobility Service Delivery Process</td>
<td>Armstrong et al (2008) [UG &amp; Grad]</td>
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<tr>
<td>4</td>
<td>Seating and Mobility Assessment Process</td>
<td>Ch 8[UG &amp; Grad] Ch 16 [Grad]</td>
<td>Quiz: Seating and Mobility service delivery and assessment processes [UG &amp; Grad]</td>
</tr>
<tr>
<td>6</td>
<td>Manual Mobility: Independent Propeller</td>
<td>Ch 9[UG &amp; Grad]</td>
<td>Technology Evaluation #1 [Grad]</td>
</tr>
<tr>
<td>7</td>
<td>Manual Mobility: Dependent Propeller</td>
<td>Ch 14[UG &amp; Grad]</td>
<td>Quiz: Manual Mobility [UG &amp; Grad]</td>
</tr>
<tr>
<td>8</td>
<td>Power Mobility: Overview</td>
<td>Ch 10[UG &amp; Grad]</td>
<td>Case Report #1 [Grad]</td>
</tr>
<tr>
<td>9</td>
<td>Power Mobility: Alternative Access Methods</td>
<td>Ch 11[UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Power Mobility: Optimizing Driving and Advanced Applications</td>
<td>Ch 12 &amp; Ch 13[UG &amp; Grad]</td>
<td>Quiz: Power Mobility [UG &amp; Grad]</td>
</tr>
<tr>
<td>13</td>
<td>Mobility Transportation safety</td>
<td>Ch 24[UG &amp; Grad]</td>
<td>Quiz: Mobility Transportation [UG &amp; Grad]</td>
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<td>Course Title</td>
<td>Chapters</td>
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<tr>
<td>14</td>
<td>SWM</td>
<td>Seating and Wheeled Mobility</td>
<td>Ch 17, 18, 20[UG &amp; Grad]</td>
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</tbody>
</table>

SWM – Seating and Wheeled Mobility  
EAT – Essentials of Assistive Technology
# NEW COURSE REQUEST FORM

**Submission Date:** 11/15/2018

## General Information

**EFFECTIVE TERM:** Autumn 2019

**Course Bulletin Listing/Subject Area:** Occupational Therapy

**Fiscal Unit/Academic Org:** D2504 - SHRS

**College/Academic Org List:** Health and Rehabilitation Sci

**Level/Career:**
- Undergraduate
- Graduate
- Professional

**Course Number/Catalog:** HTHRSC 5400

**Honors Designation:** Select

**Course Title:** Computer, Communication and Control Technologies for Individuals with Disabilities (Max 100 Characters)

**Transcript Abbreviation:** CCC Tech for IWD (Max 18-Characters)

**Course Description:**
Students learn how to develop and implement assistive technology devices and services which focus on computer, communication and control technologies. The course includes information on information and communication technologies, control interfaces, electronic aids to daily living, internet of things, zero-effort technologies, educational technologies, and emerging technologies.

**Semester Credit Hours:**
- Fixed
- Variable

## Offering Information

**Length of Course:**
- 4 Week (May Session)
- 7 Week
- 14 Week
- 12 Week (May + Summer)

**Flex Schedule Course:** No

**Distance Education Component:** Yes

**Grading Basis (Select one):**
- Letter Grade
- Satisfactory/Unsatisfactory
- Progress – S/U
- Progress – Letter

**Repeatable:** No
*If Yes, state: _____
*Maximum number of credit hours / units allowed: _______
*Maximum number of separate course completions allowed: _______
*Whether to allow multiple enrollments in a term: Select One

*Course Component *Graded Component
___ Seminar 
____ Seminar
___ Clinical 
____ Clinical
____ Field Experience
____ Field Experience
____ Independent Study
____ Independent Study
____ Laboratory
____ Laboratory
 X Lecture
____ Lecture
____ Workshop
___ Workshop
____ Recitation
___ Recitation

*Credit Available by Exam: No
*If yes, select exam type (Note: check all that apply)
____ Advanced Placement Program (AP)
____ College Level Examination Program (CLEP)
____ Departmental Exam
____ EM Tests via university Office of Testing
____ International Baccalaureate

*Off Campus: Always

*Campus Offering (Check all that Apply): __X__ Columbus  _____ LIMA  _____ other – which one(s)?
________________________________________

Prerequisites and Exclusions
*Prerequisites/Co-requisites: Max 500 Characters (Write out prerequisites here!)
Prerequisites: 3rd year standing or greater
HTHRHSC 5XXX or equivalent; Or by consent of the instructor
*Exclusions: None
Max 500 Characters (Write any exclusions here (quarter equivalencies, etc.))

Cross-Listings
*Cross-Listings: None
Max 250 Characters (Will your course be cross listed with any other course? If so, which one(s)?)

Subject/CIP Code
*Subject/CIP Code: 51.2312
(Note: search <http://nces.ed.gov/ipeds/cipcode/> for list of options)

*Subsidy Level: Doctoral  *Must match highest intended rank

*Intended Rank (Check all that apply)
____ Freshman  ____ Sophomore  ____ X Senior  ____ X Junior  X Masters  ____ Professional
XX ___ Doctoral
**Requirement/Elective Designation** (Note: check all that apply)

- Required for this unit’s degrees, majors, and/or minors
- General Education course
- *If yes, for which topic(s) does this course meet the requirements*
- X The course is an elective (for this or other units) or is a service course for other units

**COMMENTS:** Course is offered in Autumn (List course comments here, including term(s)/session(s) when course is offered)

### Course Goals or Learning Objectives/Outcomes (knowledge, skills, and attitudes/perspectives)

1. Students will gain a general understanding of computer, communication and control (CCC) technologies.
2. Students will gain a general understanding of technology designed for individuals with a disability.
3. Students will understand/analyzer the different types of CCC technologies.
4. Students will understand the interaction between individuals with disabilities and CCC technologies.
5. Students will understand the framework of CCC technologies services, devices, strategies, and practices.
6. Students will understand the service delivery process for CCC technologies across multiple settings.
7. Students will gain a general understanding of the use of CCC technologies for rehabilitation technology, performance measures and outcome measures.

### Content Topic List

Overview of Assistive Technology
Making the Connection: User Inputs & Control Interfaces for Assistive Technologies
Accessing Mainstream Information and Communication Technologies: The Technology and the Web
Technologies That Aid Manipulation and Control of the Environment
Assistive Technologies for Cognitive Augmentation.
Introduction to Zero-Effort Technologies
Designing, Building and Evaluating ZETs
Fundamentals of Robotic Assistive Technologies
Human-Robot Interaction for Rehabilitation Robots
Assistive Robotic Manipulators
Robotic Systems for Augmentative Manipulation to Promote Cognitive Development, Play and Education
Social Assistive Robots for Children with Complex Disabilities
Robots Supporting Care for Elderly People
Ethical and Social Implications of the Use of Robots in Rehabilitation Practice

### Approval Signatures

**Faculty Member Course Initiator:**

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date 11/15/2018</th>
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</table>

**Department/Division Director:**

<table>
<thead>
<tr>
<th>Signature</th>
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<tbody>
<tr>
<td>Role</td>
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<tr>
<td>-------------------------------------</td>
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</tr>
<tr>
<td>Curriculum Chair:</td>
<td></td>
</tr>
<tr>
<td>Graduate Studies Committee Chair:</td>
<td></td>
</tr>
<tr>
<td>Academic Unit Chair/School Director</td>
<td></td>
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<tr>
<td>Honors (if appropriate)</td>
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HTHRHSC 5400 Computer, Communication and Control Technologies for Individuals with Disabilities.

<table>
<thead>
<tr>
<th><strong>Course number:</strong></th>
<th>HTHRHSC 5400</th>
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<tr>
<td><strong>Instructor:</strong></td>
<td>Carmen P. DiGiovine, PhD, ATP/SMS, RET</td>
</tr>
<tr>
<td><strong>Phone number:</strong></td>
<td>614.293.7876 (DiGiovine)</td>
</tr>
<tr>
<td><strong>E-mail:</strong></td>
<td><a href="mailto:digiovine.1@osu.edu">digiovine.1@osu.edu</a></td>
</tr>
<tr>
<td><strong>Office Location:</strong></td>
<td>406 Atwell Hall</td>
</tr>
<tr>
<td><strong>Graded:</strong></td>
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<td><strong>Credit Hours:</strong></td>
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<td><strong>Office Hours:</strong></td>
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<tr>
<td><strong>Prerequisite:</strong></td>
<td>Introduction to Assistive Technology or Instructor Approval</td>
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**Course Description:**
Students learn how to develop and implement assistive technology devices and services which focus on computer, communication and control technologies. Students build on the assistive technology device and service delivery framework introduced in “Introduction to Assistive Technology”. Students achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on computer, communication and control technologies. Students will also achieve competency in the understanding and application of different types of assistive technology. The course includes information on information and communication technologies, control interfaces, electronic aids to daily living, internet of things, zero-effort technologies, educational technologies, and emerging technologies. Finally, the course will introduce the potential use of computer, communication and control technologies as rehabilitation technology, performance measures and outcome measures. This course begins to lay the foundation for an individual interested in the successful completion of the RESNA Assistive Technology Professional (ATP) certification and the Seating and Mobility Specialist (SMS) Certification.

**Required Text (UG & Grad):**

**Required Articles (Grad)**


**Recommended Text:**


**Course Goals:**

1. Students will gain a general understanding of computer, communication and control (CCC) technologies.
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3. Students will understand/analyze the different types of CCC technologies.
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6. Students will understand the service delivery process for CCC technologies across multiple settings.
7. Students will gain a general understanding of the use of CCC technologies for rehabilitation technology, performance measures and outcome measures.

**General Course Learning Objectives:**

At the conclusion of this course, the student will be able to:

1. Define assistive technology in terms of devices, services, practices and strategies.
2. Demonstrate the effective utilization of rehabilitation technology.
3. List the different types of CCC technologies.
4. Compare and contrast different types of CCC technologies.
5. Identify the roles of individuals who are associated with the provision of CCC technologies.
6. Demonstrate proper assessment practices (client, physical, technology, outcome measures)
7. Demonstrate appropriate documentation
8. Accurately represent and articulate the goals of the individual with a disability
9. Interpret available measurement tools for CCC technologies
10. Recognize the need and process of equipment modifications
11. Understand the integration and customization of technology within CCC technologies
12. Identify the existing/current use of equipment
13. Describe the unique needs of children, adults, and older adults living with a disability.
14. Recognize the application of emerging technologies as CCC technologies.

**Graduate Level Course Learning Objectives:**
At the conclusion of this course, the graduate student will be able to:
1. Analyze case examples of the key milestones to acquisition of CCC technologies (assessment, implementation, training and follow-up).
2. Employ evidence-based practice.
3. Differentiate the roles of individuals who are associated with the provision of CCC technologies.
4. Analyze the unique needs of children, adults, and older adults living with a disability when utilizing information and communication technologies, and electronic aids to daily living.
5. Synthesize multiple technologies for a comprehensive information and communication system to meet the work, school or community needs of an individual.
6. Compare and contrast outcome measures and performance measures.

**Assignments:**
Quizzes: Identify, define, and apply CCC devices and services.
Class Participation – Compare and contrast service delivery models, devices and emerging technologies in CCC.
Final Exam – Identify and recognize key components of CCC services, strategies, devices and practices.

**Graduate Level Assignments (in addition to above):**
Case report(s) based on assistive technology assessment variables – Apply assistive technology service delivery process to case scenarios as it relates to CCC technologies.
Technology Evaluation(s) based on the assistive technology device review.

**Grading Policy**

<table>
<thead>
<tr>
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<th>Percentage</th>
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<tbody>
<tr>
<td>Quizzes</td>
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<td>Class Participation</td>
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<td>Evaluation</td>
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<tr>
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**Class Participation:** Students are expected to participate in all class activities. This includes completing all assigned readings and actively participating in online discussions. Students are expected to have questions prepared based on the assigned readings. Students are expected to notify instructors as early as possible by email if they will be unable to participate in a class activity. In the event of an absence it is the student’s responsibility to complete all classwork missed.

**Case Reports (Graduate):** Case reports will be based on cases provided case studies provided by the instructor. Case reports will follow the assistive technology assessment variables template.

**Technology Evaluations (Graduate):** The assistive technology / rehabilitation technology device evaluation will follow the assistive technology device review template.

**Final Exam:** The exam will be online and open book.

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**Weekly Course Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of Assistive Technology</td>
<td>Ch 1 AT:P&amp;P [UG &amp; Grad] Andrich et al. (2013) [Grad]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Accessing Mainstream Information and Communication Technologies: The Technology and the Web</td>
<td>Ch 8 AT:P&amp;P [UG &amp; Grad]</td>
<td>Quiz: Information and Communication Technologies [UG &amp; Grad]</td>
</tr>
<tr>
<td>4</td>
<td>Technologies That Aid Manipulation and Control of the Environment</td>
<td>Ch 12 AT:P&amp;P [UG &amp; Grad]</td>
<td>Quiz: Electronic Aids to Daily Living [UG &amp; Grad]</td>
</tr>
<tr>
<td>6</td>
<td>Introduction to Zero-Effort Technologies</td>
<td>Ch 1 ZET [UG &amp; Grad]</td>
<td>Technology Evaluation #1 [Grad]</td>
</tr>
<tr>
<td>7</td>
<td>Designing, Building and Evaluating ZETs</td>
<td>Ch 2 &amp; 3 ZET [UG &amp; Grad]</td>
<td>Quiz: Zero Effort Technologies [ UG &amp;Grad]</td>
</tr>
<tr>
<td>8</td>
<td>Fundamentals of Robotic Assistive Technologies</td>
<td>Ch 1 RAT [UG &amp; Grad]</td>
<td>Case Report #1 [Grad]</td>
</tr>
<tr>
<td>9</td>
<td>Human-Robot Interaction for Rehabilitation Robots</td>
<td>Ch 2 RAT [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Assisitive Robotic Manipulators</td>
<td>Ch 3 RAT [UG &amp; Grad]</td>
<td>Quiz: Robotic Assistive Technologies #1 [UG &amp; Grad]</td>
</tr>
<tr>
<td>11</td>
<td>Robotic Systems for Augmentative Manipulation to Promote Cognitive Development, Play and Education</td>
<td>Ch 7 RAT [UG &amp; Grad]</td>
<td>Technology Evaluation #2 [Grad]</td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
<td>Readings</td>
<td>Assignments</td>
</tr>
<tr>
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<td>------------------------------------------------------------</td>
<td>----------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>12</td>
<td>Social Assistive Robots for Children with Complex Disabilities</td>
<td>Ch 8 RAT [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Robots Supporting Care for Elderly People</td>
<td>Ch 9 - RAT [UG &amp; Grad]</td>
<td>Case Report #2 [Grad]</td>
</tr>
<tr>
<td>14</td>
<td>Ethical and Social Implications of the Use of Robots in Rehabilitation Practice</td>
<td>Ch 10 RAT [UG &amp; Grad]</td>
<td>Quiz: Robotic Assistive Technologies #2[UG &amp; Grad]</td>
</tr>
</tbody>
</table>

RAT - Robotic Assistive Technologies: Principles and Practice  
AT:P&P - Assistive Technologies: Principles and Practice  
ZET - Zero-effort technologies: considerations, challenges, and use in health, wellness, and rehabilitation
**NEW COURSE REQUEST FORM**

**Submission Date:** 11/15/2018

### General Information

* **EFFECTIVE TERM:** Autumn 2019

* **Course Bulletin Listing/Subject Area:** Occupational Therapy

* **Fiscal Unit/Academic Org:** D2504 - SHRS

* **College/Academic Org List:** Health and Rehabilitation Sci

* **Level/Career:** Undergraduate  Graduate  Professional

* **Course Number/Catalog:** HTHRSC 5450 Honors Designation Select.

* **Course Title:** Assistive Technology for Sports and Recreation (Max 100 Characters)

* **Transcript Abbreviation:** AT for Sprts & Rec (Max 18-Characters) (This is what will show up on the student's transcript for the course)

* **Course Description:** (Maximum 400 Characters for Course Bulletin)

Students learn how to develop and implement assistive technology devices and services in adapted sports and recreation. The course includes technology for Paralympic sports, summer sports, winter sports, video games, and recreation. The course will review principles of anthropometrics, biomechanics and ergonomics as it applies to adapted sports and recreation.

* **Semester Credit Hours:** Fixed  Variable  Fixed

### Offering Information

* **Length of Course:** 4 Week (May Session)  7 Week  14 Week

* **Length of 12 Week (May + Summer) Course:** No

* **Does any section of this course have a distance education component?** Yes

* **If yes, is any section of the course offered... (Note: check all that apply)**

  * 100% at a distance?
  * Greater or equal to 50% at a distance?
  * Less than 50% at a distance?

* **Grading Basis (Select one)**

  * Letter Grade
  * Satisfactory/Unsatisfactory
  * Progress – S/U
  * Progress – Letter

* **Repeatable** No

* **If Yes, state:**
*Maximum number of credit hours / units allowed _______
*Maximum number of separate course completions allowed ______
*Whether to allow multiple enrollments in a term  Select One

<table>
<thead>
<tr>
<th>Course Component</th>
<th>*Graded Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>___ Seminar</td>
<td>___ Seminar</td>
</tr>
<tr>
<td>___ Clinical</td>
<td>___ Clinical</td>
</tr>
<tr>
<td>___ Field Experience</td>
<td>___ Field Experience</td>
</tr>
<tr>
<td>___ Independent Study</td>
<td>___ Independent Study</td>
</tr>
<tr>
<td>___ Laboratory</td>
<td>___ Laboratory</td>
</tr>
<tr>
<td>___ Lecture</td>
<td>___ Lecture</td>
</tr>
<tr>
<td>___ Workshop</td>
<td>___ Workshop</td>
</tr>
<tr>
<td>___ Recitation</td>
<td>___ Recitation</td>
</tr>
</tbody>
</table>

*Credit Available by Exam  No
*If yes, select exam type (Note: check all that apply)
  _____ Advanced Placement Program (AP)
  _____ College Level Examination Program (CLEP)
  _____ Departmental Exam
  _____ EM Tests via university Office of Testing
  _____ International Baccalaureate

*Off Campus  Always

*Campus Offering (Check all that apply):  ___ X__Columbus  _____LIMA  _____other – which one(s)?

Prerequisites and Exclusions
*Prerequisites/Co-requisites  Max 500 Characters (Write out prerequisites here!)
Prerequisites: 3rd year standing or greater
HTHRHSC 5XXX or equivalent; Or by consent of the instructor
*Exclusions  None
Max 500 Characters (Write any exclusions here (quarter equivalencies, etc.))

Cross-Listings
*Cross-Listings  None
Max 250 Characters (Will your course be cross listed with any other course? If so, which one(s)?)

Subject/CIP Code
*Subject/CIP Code  51.2312 (Note: search <http://nces.ed.gov/ipeds/cipcode/> for list of options)

*Subsidy Level  Doctoral  *Must match highest intended rank

*Intended Rank (Check all that apply)
  _____ Freshman  _____ Sophomore  ____X__Senior  ____X__Junior  X_Masters  __ Professional
  __XX__Doctoral

*Requirement/Elective Designation (Note: check all that apply)
Course Goals or Learning Objectives/Outcomes (knowledge, skills, and attitudes/perspectives)

1. Students will gain a general understanding of adapted sports and recreation (ASR).
2. Students will gain a general understanding of technology designed for individuals with a disability.
3. Students will understand/analyze the different types of ASR technologies.
4. Students will understand the interaction between individuals with disabilities and ASR technologies.
5. Students will understand the framework of ASR technologies services, devices, strategies, and practices.
6. Students will understand the service delivery process for ASR technologies across multiple settings.
7. Students will gain a general understanding of the use of ASR technologies for rehabilitation technology, performance measures and outcome measures.

Content Topic List

- Overview of Assistive Technology
- Adapted Sports and Recreation
- Adapted Sports Technology
- Physical Activity for Children with Disability
- Exercise & Training
- Paralympic sports
- Summer Sports
- Winter Sports
- Wheelchair Court Sports
- Wheelchair Racing Track and Field
- Classification for adapted sports
- Sports injuries and Sports Medicine
- Biomechanics, Performance and Outcome Measures
- Sensors for Training and Design

Approved Signatures

Faculty Member Course Initiator:

Signature: [Signature]
Date: 11/15/2018

Department/Division Director:
<table>
<thead>
<tr>
<th>Signature</th>
<th>Date 11/15/2018</th>
</tr>
</thead>
</table>

**Curriculum Chair:**

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
</table>

**Graduate Studies Committee Chair:**

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
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</thead>
</table>

**Academic Unit Chair/School Director:**

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
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</table>

**Honors (if appropriate):**

<table>
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<tr>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
</table>

Form 11/14/2013
School of Health and Rehabilitation Sciences
# Assistive Technology for Sports and Recreation

**Course number:** HTHRHSCE 5450  
**Instructor:** Carmen P. DiGiovine, PhD, ATP/SMS, RET  
**Phone number:** 614.293.7876 (DiGiovine)  
**E-mail:** digiovine.1@osu.edu  
**Office Location:** 406 Atwell Hall  
**Graded:** OSU Standard Grading  
**Format:** Online  
**Credit Hours:** 3 hours  
**When Taught:** TBD  
**Office Hours:** TBD  
**Prerequisite:** Introduction to Assistive Technology or Instructor Approval

## Course Description:
Students learn how to develop and implement assistive technology devices and services which focus on adapted sports and recreation. Students build on the assistive technology device and service delivery framework introduced in “Introduction to Assistive Technology”. Students achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on adapted sports and recreation technology. Students will also achieve competency in the understanding and application of different types of assistive technology that integrate with sports and recreation. The course includes information on the technology used in Paralympic sports, summer sports (e.g. wheelchair court sports, water sports), winter sports (e.g. skiing), video games, and recreation (e.g. camping). The course will review principles of anthropometrics, biomechanics and ergonomics as it applies to sports and recreation for individuals with disabilities. Finally, the course will introduce the potential use of adapted sports and recreation technologies as rehabilitation technology, performance measures and outcome measures. This course begins to lay the foundation for an individual interested in the successful completion of the RESNA Assistive Technology Professional (ATP) certification and the Seating and Mobility Specialist (SMS) Certification.

## Required Text:


https://doi.org/10.1123/apaq.2016-0149

https://doi.org/10.1080/02640414.2014.949829

https://doi.org/10.1080/02640414.2011.576694

https://doi.org/10.1123/ijspp.2017-0326


https://doi.org/10.1016/j.pmrj.2014.05.022

https://doi.org/10.1016/j.pmrj.2010.02.002


**Recommended Text:**

https://doi.org/10.1080/09638280701240714

https://doi.org/10.1515/hukin-2015-0098

https://doi.org/10.1016/j.apergo.2017.09.005


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6. Students will understand the service delivery process for ASR technologies across multiple settings.
7. Students will gain a general understanding of the use of ASR technologies for rehabilitation technology, performance measures and outcome measures.

**General Course Learning Objectives:**

At the conclusion of this course, the student will be able to:

1. Define assistive technology in terms of devices, services, practices and strategies.
2. Demonstrate the effective utilization of rehabilitation technology.
3. List the different types of ASR technologies.
4. Compare and contrast different types of ASR technologies.
5. Identify the roles of individuals who are associated with the provision of ASR technologies.
6. Demonstrate proper assessment practices (client, physical, technology, outcome measures)
7. Demonstrate appropriate documentation
8. Accurately represent and articulate the goals of the individual with a disability
9. Interpret available measurement tools for CCC technologies
10. Recognize the need and process of equipment modifications
11. Understand the integration and customization of technology within ASR technologies
12. Identify the existing/current use of equipment
13. Describe the unique sports and recreation needs of children, adults, and older adults living with a disability.
14. Recognize the application of emerging technologies as ASR technologies.

**Graduate Level Course Learning Objectives:**
At the conclusion of this course, the graduate student will be able to:
1. Analyze case examples of the key milestones to acquisition of ASR technologies (assessment, implementation, training and follow-up).
2. Employ evidence-based practice.
3. Differentiate the roles of individuals who are associated with the provision of ASR technologies.
4. Analyze the unique needs of children, adults, and older adults living with a disability when utilizing ASR technologies.
5. Select, apply and interpret anthropometric and biomechanical measures.
6. Compare and contrast outcome measures and performance measures.

**Assignments:**
Quizzes: Identify, define, and apply ASR devices and services.
Class Participation – Compare and contrast service delivery models, devices and emerging technologies in ASR.
Final Exam – Identify and recognize key components of ASR services, strategies, devices and practices.

**Graduate Level Assignments (in addition to above):**
Case report(s) based on assistive technology assessment variables – Apply assistive technology service delivery process to case scenarios as it relates to ASR technologies.
Technology Evaluation(s) based on the assistive technology device review.

**Grading Policy**

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>70</td>
</tr>
<tr>
<td>Class Participation</td>
<td>10</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
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<table>
<thead>
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<th>Evaluation</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>50</td>
</tr>
<tr>
<td>Class Participation</td>
<td>10</td>
</tr>
<tr>
<td>Case Report</td>
<td>20</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Quizzes:** All quizzes will be on Carmen and will be timed. Dates of when quizzes will be
open and closed will be announced. Anyone missing these items will receive a reduction in total possible score of one letter grade per day. These will be open book quizzes. It is the student’s responsibility to report to the instructor if there are any problems during the completion of the quizzes.

**Class Participation:** Students are expected to participate in all class activities. This includes completing all assigned readings and actively participating in online discussions. Students are expected to have questions prepared based on the assigned readings. Students are expected to notify instructors as early as possible by email if they will be unable to participate in a class activity. In the event of an absence it is the student’s responsibility to complete all classwork missed.

**Case Reports (Graduate):** Case reports will be based on cases provided case studies provided by the instructor. Case reports will follow the assistive technology assessment variables template.

**Technology Evaluations (Graduate):** The assistive technology / rehabilitation technology device evaluation will follow the assistive technology device review template.

**Final Exam:** The exam will be online and open book.

**Grading Scale:**

<table>
<thead>
<tr>
<th>Percent</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-100</td>
<td>A</td>
</tr>
<tr>
<td>90-92</td>
<td>A-</td>
</tr>
<tr>
<td>87-89</td>
<td>B+</td>
</tr>
<tr>
<td>83-86</td>
<td>B</td>
</tr>
<tr>
<td>80-82</td>
<td>B-</td>
</tr>
<tr>
<td>77-79</td>
<td>C+</td>
</tr>
<tr>
<td>73-78</td>
<td>C</td>
</tr>
<tr>
<td>70-72</td>
<td>C-</td>
</tr>
<tr>
<td>65-69</td>
<td>D</td>
</tr>
<tr>
<td>Below 65</td>
<td>F</td>
</tr>
</tbody>
</table>

**Course Policies:**
All School and Program course policies apply to this course.

**Online Structure:** This course will be conducted in a distance-learning, online format. All materials will be provided via Carmen and all assignments will be completed via Canvas file upload. All necessary materials will be provided in the content section of Carmen. A tutorial is available at [https://ocio.osu.edu/audience/students](https://ocio.osu.edu/audience/students). Notices about this course will be sent to your [name.#@buckeyemail.osu.edu](mailto:name.#@buckeyemail.osu.edu) account. All students must have an active OSU email account and remain electronically connected to OSU. Emails may be forwarded to an external email address. Please contact the Help Desk for more information.

**Course technology:** For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at [https://ocio.osu.edu/help/hours](https://ocio.osu.edu/help/hours), and support for urgent issues is available 24x7.
Self-Service and Chat support: http://ocio.osu.edu/selfservice • Phone: 614-688-HELP (4357)  
Email: 8help@osu.edu • TDD: 614-688-8743

**Academic Misconduct:** The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism, collaboration on assignments assigned to be independent, using the same work for more than one course, and dishonest practices in connection with examinations and quizzes. The code of student conduct defines plagiarism as “… the representation of another’s work or ideas as one’s own; it includes the unacknowledged word-for-word use and/or paraphrasing of another person’s work, and/or the inappropriate unacknowledged use of another person’s idea.” Students are expected to report to the instructor peers’ actions that they believe to represent academic misconduct.

Instructors shall report all instances of alleged academic misconduct to the committee and the committee will determine a course of action (Facility Rule 3335-5-487). For additional information, see the Code of Student Conduct [http://studentconduct.osu.edu/]. Please see SHRS Student Handbook Policy #2 - Academic Misconduct.

**School and Program Handbooks:** Handbooks are available on the SHRS website: hrs.osu.edu. These handbooks provide all required policies and procedures required for students accepted into academic programs in SHRS.

**Disabilities:** The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue

**Counseling and Consultation Services:**
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also
available through the 24/7 National Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org

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<tr>
<td>------</td>
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</tr>
<tr>
<td>2</td>
<td>Adapted Sports and Recreation</td>
<td>Wilson &amp; Clayton (2010) [UG &amp; Grad]</td>
<td>Quiz: Adapted Sports and Recreation [UG &amp; Grad]</td>
</tr>
<tr>
<td>3</td>
<td>Adapted Sports Technology</td>
<td>Jaarsma et al (2014); DeLuigi &amp; Cooper (2014); Cooper &amp; DeLuige (2014) [UG &amp; Grad]</td>
<td>Quiz: Adaptive Sports and Recreation &amp; Technology [UG &amp; Grad]</td>
</tr>
<tr>
<td>4</td>
<td>Physical Activity for Children with Disability</td>
<td>Shields et al (2011) [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Exercise &amp; Training</td>
<td>Martin Ginis et al. (2017); Simim et al (2017) [UG &amp; Grad]</td>
<td>Quiz: Exercise &amp; Training [UG &amp; Grad]</td>
</tr>
<tr>
<td>6</td>
<td>Paralympic sports</td>
<td>Willicak &amp; Lexell (2014); Goosey-Toffrey (2010); Burkett (2010) [UG &amp; Grad]</td>
<td>Technology Evaluation #1 [Grad]</td>
</tr>
<tr>
<td>9</td>
<td>Wheelchair Court Sports</td>
<td>Paulson &amp; Coosey-Toffrey (2017); Mason et al (2014); [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Wheelchair Racing Track and Field</td>
<td>Blauweit et al (2016); Rice et al (2015); Cooper (1990) [UG &amp; Grad]</td>
<td>Quiz: Wheelchair Sports [UG &amp; Grad]</td>
</tr>
<tr>
<td>11</td>
<td>Classification for adapted sports</td>
<td>van der Slikke (2017); Vanlandewijck et al (2011) [UG &amp; Grad]</td>
<td>Quiz: Classification [UG &amp; Grad]</td>
</tr>
</tbody>
</table>
James Onate, PhD.
HRS Graduate Studies Chair

November 8, 2018

Sarah Varekojis, PhD
HRS Curriculum Committee Chair

Drs. Onate and Varekojis,

This letter is written in support of the Assistive and Rehabilitative Technology Certificate (ATRC) developed by Dr. Carmen DiGiovine and housed in the Division of Occupational Therapy. The ARTC program will provide health science, engineering, rehabilitation counseling and education students and professionals with knowledge about and the skills to apply science and technology in order to improve the quality of life of individuals with disabilities. This certificate program is part of our strategic plan for division growth and meets a need in the assistive technology industry for students and professionals desiring to better serve individuals with disabilities. The certificate is offered in an online format and will be available for undergraduate students, graduate students, and working professionals. The certificate also meets the professional development goals of Dr. DiGiovine as he expands his teaching responsibilities in the School of Health and Rehabilitation Sciences.

This certificate aligns with the OT Division Strategic Plan Goal 1 for Teaching and Learning Goal, Strategy 1.3: *Expand innovative course and program offerings within the Division of Occupational Therapy* as well as Divisional and School initiatives to increase the number of online course offerings. It also supports our goals to offer students across campus exposure to the unique strengths of the School of Health and Rehabilitation Sciences. The certificate will be useful to professional students in our school (e.g. Athletic Training, Occupational Therapy, Physical Therapy) who are seeking additional coursework in assistive technology, wheelchair seating and positioning, adaptive sports or augmentative communication devices. Additionally, the 5 courses contained in the ATRC will complement the studies of students in other disciplines such as health sciences, medicine, engineering, education and social work.

I support this new certificate and am very pleased at the product Dr. DiGiovine has designed.

Sincerely,

Amy Darragh, PhD, OTR/L, FAOTA
CONCURRENCE FORM
The Ohio State University
School of Health and Rehabilitation Sciences College of Medicine Concurrence Form

Academic units receiving this form should respond to Section B and return the form to the initiating unit.

Overlap of course content and other problems should be resolved by the academic units before this form and all other accompanying documentation may be forwarded to the Office of Academic Affairs.

A. Proposal to review

Initiating Academic Unit Occupational Therapy – School of Health and Rehabilitation Sciences
Type of Proposal (New, Change, Withdrawal, or other): New
Date request sent: 11/6/18
Academic Unit Asked to Review: Speech and Hearing Sciences
Date response needed: 11/15/18

B. Response from the Academic Unit reviewing

Response: include a reaction to the proposal, including a statement of support or non-support (continued on the back of this form or a separate sheet, if necessary).

November 10, 2018

This letter is written in support of the Adaptive and Rehabilitative Technology Certificate Program from the Division of Occupational Therapy. Dr. DiGiovine has worked with multiple members of the faculty in the Department of Speech and Hearing Science and was recently appointed to adjunct faculty level within the department. Dr. Bean Ellawadi and Mrs. Sonntag was working with Dr. DiGiovine to integrate some speech and hearing courses into this certificate program.

This certificate fulfills a definite need and does not duplicate content from any other course in our school.

Sincerely,

Robert Allen Fox
Professor and Department Chair
Carmen P. DiGiovine, PhD ATP/SMS RET  
Associate Professor – Clinical  
School of Health and Rehabilitation Sciences

Carmen:

It is my sincere pleasure to write this letter and express my full support for the new Assistive and Rehabilitative Technology Certificate (ARTC) program within the School of Health and Rehabilitation Sciences. The program has broad appeal to a wide audience, including engineers, and you have the expertise and support of many colleagues, including me, to make this a success.

We have been working together for almost ten years, bringing educational experiences to students in engineering and health science. You have committed significant time to my senior design course, bringing project ideas and mentorship on multiple projects, and integrating DPT and OTD students with the engineering teams in a meaningful way. This new ARTC program is a natural next step for you in training multiple groups of students in a cross-disciplinary way.

I think this program will appeal to both undergraduates and graduate students in Biomedical Engineering. We already have BME graduates that choose to pursue a career in Occupational and Physical Therapy. In addition, expected revisions in the undergraduate curriculum in the next few years would open multiple course options that could be either engineering or non-engineering courses, giving BME students greater flexibility to choose courses in this program. Graduate students already have the flexibility to do so.

I would also like to express my support in the area of lectures and hands-on learning. We already share a close collaboration in the senior design course, and I would be happy to extend this to the ARTC program. As you know, Biomedical Engineering will be moving into a new building on the engineering campus in Summer 2020, and so we will have all new facilities and some new equipment to help with hands-on learning experiences. I would be happy to discuss how we can leverage our resources to strengthen the program.

Thank you for including Biomedical Engineering as a partner in this new certificate program. I look forward to working with you and making the ARTC program a great success.

Sincerely,

Mark A. Ruegsegger, PhD, PE  
Chair, BME Undergraduate Studies Committee
Assistive and Rehabilitative Technology Certificate Program

Division: Occupational Therapy
School: Health and Rehabilitation Sciences
College: Medicine

Program Learning Goals

The goal of the enrolled students is two-fold: 1) obtain an Assistive Technology Professional (ATP) Certification and Seating and Mobility Specialist (SMS) Certification, and 2) distinguish themselves among their peers in the field. The completion of the certificate program and the attainment of the RESNA certification(s) will distinguish students as competent in the integration of technology for individuals with disabilities. The goals and learning outcomes of the certificate program focus on the application and design of assistive and rehabilitative technology for individuals with disabilities.

Program Goals

1. Students will understand the role of technology as it relates to individuals with disabilities.
2. Students will appreciate the AT service delivery process.
3. Students will learn how to utilize rehabilitative technology in the AT service delivery process.
4. Students will value the role of an interprofessional collaboration in the AT service delivery process.
5. Students will understand the types of assistive and rehabilitative technology.

Purpose of Program

Currently, there are over 1 billion individuals with a disability throughout the world[1] and 56.7 million individuals with a disability in the United States[2]. The number of individuals with disabilities is increasing in the United States as the percentage rose from 11.9 in 2010 to 12.6 in 2013 and 2014. Furthermore, the rates of disability increase with age.[3] These numbers are trending upwards given the decreased mortality due to acute injuries, accidents and medical events, and the increasing number of older adults who are aging into a disability. One mechanism for addressing the increasing number of individuals with disability is technology, which comes in the form of assistive technology and rehabilitative technology. Assistive technology is defined as any technology which improves the quality of life of individuals with a disability on a daily basis, and includes devices, services, practices and strategies[4]. Assistive technology is inclusive of mainstream technology (e.g. consumer electronics), educational technology and general-purpose technology, as well as technology designed specifically for individuals with disabilities, as the assistive part is defined by the use-case, not the individual components of the technology. Rehabilitative technology is defined as technology that is utilized by educational, engineering or healthcare professionals to measure performance or...
maintain/increase function, typically in the school or healthcare settings [5]. In order to meet the needs of individuals with disabilities over the next generation, we will need to educate a workforce that can design, fabricate and implement both assistive and rehabilitative technology. The workforce will include clinicians, technicians, technologists, engineers, educators, rehabilitation counselors and researchers. Therefore, the purpose of the assistive and rehabilitative technology certificate (ARTC) program is to educate health science, engineering, rehabilitation counseling and education professionals on the application of science and technology for improving the quality of life of individuals with disabilities. The program will provide a foundation of assistive technology and rehabilitative technology principles that will translate into fields that support individuals with disabilities and older adults.

Certificate Program Category

We are requesting certificate program categories:
- 2 (Undergraduate Academic Certificate Program: Post Bachelor Degree),
- 3a (Graduate Academic Certificate Program: Post Bachelor Degree) and
- 5a (Technician / Professional Certification Program) for the ART Certificate Program.

We are requesting category 2 to specifically meet the educational goals of undergraduate students in the engineering, health science, and speech and hearing science programs. We are requesting category 3a to meet the educational goals of non-degree seeking post-professional students, as we anticipate this will be the largest cohort of students. We are also requesting category 3a to meet the educational goals of graduate students in the health sciences (e.g. Occupational Therapy, Physical Therapy) or non-degree seeking professionals who have the assistive technology professional (ATP) or seating and mobility specialist (SMS) certifications. Finally, we are requesting category 5a to meet the educational goals of non-degree seeking professionals who are aspiring to get the ATP certification and SMS certification. The ATP and SMS certifications are administered by the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA). The ATP certification is a pre-requisite for the SMS certification, and is a requirement for professionals in the field of assistive and rehabilitative technology.

Minimum requirements to complete program and sample program

The goal of the ARTC program is to complete the program in 2-4 semesters (9-16 months). The certificate program will include 4 online courses. The foundational course is HTHRHSC 5100: Introduction to Assistive Technology, which is required by all students in the program. The student will complete three specialty courses as part of the program. The specialty courses are HTHRHSC 5400: Computers, Communication and Controls for Individuals with Disabilities (CCC), HTHRHSC 5450: Assistive Technology for Sports and Recreation (ATSR), and HTHRHSC 5200: Assistive Technology for Seating and Mobility (ATSM). We anticipate 2 sections of each course, one for undergraduate credit and one for graduate credit. Course descriptions for each course can be found in Appendix B.

Flexibility of program and opportunity for electives
Initially there will be 3 specialty courses: CCC, ATSM, and ATSR. In the future we plan on incorporating other specialty courses, which would allow for greater flexibility when selecting specialty courses in the certificate program. The specialty courses include, but are not limited to: augmentative and alternative communication, driver rehabilitation, rehabilitation engineering design, rehabilitation science & technology (biomechanics and anthropometrics for individuals with disabilities), pediatric assistive technology, fieldwork/internships, and hands-on labs. We anticipate that we will begin to roll out the electives in 2022, depending on the success of the proposed certificate program.

Length of program compared to similar programs

The length of the certificate program is highly comparable to other assistive technology certificate programs offered in the United States. The proposed certificate program will consist of 12 mandatory credit hours, or 4 courses, in which the student has the ability to complete in 9-16 months (2-4 semesters). Example course sequence can be found in Tables 1 and 2. Currently, two online certificate programs exist with shorter program lengths: 1) California State University - Dominguez Hills (5 courses; 15 credits), and 2) California State University - Northridge (16 weeks; 7 course modules). These programs do not provide the sophistication of courses in which the proposed program has selected to implement. Additionally, Casper College offers a 16-week, 12 credit hour certificate program, but the student must attend classes on-campus. The University of Pittsburgh Rehabilitation Science and Technology Continuing Education (RSTCE) program, and the University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, both offer trainings and online courses for continuing education and eventual certification, if desired. The University of Illinois at Chicago has a 12-month, 12 credit program that can be completed on-line or as a hybrid program (on-line and lab-based). It is important to note that locating the lengths of comparable certificate programs via the programs’ websites proved challenging.

The length of the proposed ARTC program is consistent with, and in some cases shorter than, other programs. A 9-month (2 semester) program has the advantage of minimizing the impact on degree-seeking students because all specialty courses are offered at least once a year, and the foundational introduction to assistive technology course is offered 3 times a year. A 9-month program also minimizes the impact on non-degree seeking students because they will be prepared to take the RESNA ATP and SMS certification exams in only 2 semesters.
<table>
<thead>
<tr>
<th>Semester</th>
<th>Example 1 (16-months)</th>
<th>Status of course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
<tr>
<td>Autumn</td>
<td>HTHRHSC 5100: Introduction to Assistive Technology</td>
<td>Curricular Approval 12/2018 Offered: Autumn 2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>HTHRHSC 5200: Assistive Technology for Seating and Mobility</td>
<td>Curricular Approval 12/2018 Offered: Spring 2020</td>
</tr>
<tr>
<td></td>
<td>HTHRHSC 5450: Assistive Technology for Sports and Recreation</td>
<td>Curricular Approval 12/2018 Offered: Spring 2020</td>
</tr>
<tr>
<td>Summer</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
<tr>
<td>Autumn</td>
<td>HTHRHSC 5400: Computers, Communications and Controls for Individuals with Disabilities</td>
<td>Curricular Approval 12/2018 Offered: Autumn 2020</td>
</tr>
</tbody>
</table>

Table 1. Sample 16-month program
<table>
<thead>
<tr>
<th>Semester</th>
<th>Example 2 (12-months)</th>
<th>Status of course</th>
<th>Example 3 (9-months)</th>
<th>Status of course</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summer</strong></td>
<td>HTHR HSC 5100: Introduction to Assistive Technology</td>
<td>Curricular Approval 12/2018 Offered: Summer 2020</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
</tbody>
</table>

Table 2. Sample program for 12-month and 9-month programs
Comparison to other universities/programs

We identified 23 programs in the United States that currently provide a credential in assistive technology. The award level for these programs ranged from individual training courses and non-degree certificate programs to graduate degree programs. The programs included 8 graduate certificate programs, 3 post-baccalaureate certificate programs, 3 certificate programs, 3 graduate degree programs, 3 programs that provide training courses, and 3 miscellaneous programs. The programs utilize both on-line and in-person courses. A listing of the Colleges and Universities can be found in Appendix A.

Input from outside groups (i.e., accrediting body)

There is an overall need for professionals working in the field of assistive technology. The need has been documented in the literature. One of the early textbooks that identified the need was “Enabling America”[6]. The need for the development of educational centers and departments that focus on assistive technology are documented in a single issue of Technology and Disability in 2000[7]–[14]. The authors of this issue document the progression of their educational programs, with a focus on graduate education. In the meantime, the field of assistive technology has grown, partially due to the increased numbers of individuals with disabilities, but also due to the increased focus on assistive technology in the school system over the past 20 years. In response to the demand for assistive technology devices and services, RESNA developed the Assistive Technology Professional (ATP) certification in 1996, the Seating and Mobility Specialist (SMS) certification in 2010, and the Rehabilitation Engineering and Assistive Technology Education (RATE) Accreditation in 2017. The development of the ATP and SMS certifications, and the RATE accreditation has created the opportunity for educational programs to train individuals with the explicit goal of attaining the ATP and SMS certifications. The RATE accreditation provides a clear pathway for educational programs, which will guide the development of the AT certification program. The RATE accreditation will signal to potential students that the OSU ARTC program is a top tier educational program. Though we are not ready to apply for accreditation, this is our long-term goal.

The assistive technology industry has exploded as a result of the increase in the number of individuals with disabilities, the increase in older adults aging into a disability, and the inclusion of accessibility features in consumer products (e.g. Swype, Voice Over). However, a gap exists in the number of qualified professionals working in AT or RT. In the manufacturing sector, engineers, designers and sales representatives lack the skills, knowledge and experience to develop and integrate technology that meets the unique needs of individuals with disabilities. Vendors that sell assistive technology (e.g. wheelchairs, automobile modifications) often cannot find technicians with clinical skills, or clinicians with the technical skills. In the primary, secondary and postsecondary education settings, there is a need for educators, clinicians, technicians and engineers to provide assistive technology services and devices to students with disabilities. The educators and clinicians need technical skills, while technicians and engineers need educational and clinical skills in order to best address the needs of students with disabilities. Employers must spend significant resources to train new and current employees. Therefore, there is a need for an interprofessional program that not only provides
undergraduate, graduate and post-professional students the foundational education in assistive technology, but also provides them with an interprofessional experience that prepares them for a career in assistive technology.

Exit criteria
In order to exit the program successfully, students must receive a passing grade of all required courses and fulfill all requirements.

Adequate Enrollment
We anticipate three types of students will enroll in the ARTC Program: non-degree seeking students, undergraduate students enrolled at OSU, and graduate students enrolled at OSU. The largest cohort, and primary focus of the certificate program, includes non-degree seeking students who want to specialize in assistive technology (Academic Certificate Program Categories 3a and 3b). The cohort of non-degree seeking students includes post-professional students from the fields of engineering, occupational therapy, physical therapy, rehabilitation counseling, special education and speech-language pathology. This cohort also includes current assistive technology professionals who are interested in continuing education opportunities and aspiring assistive technology professionals who are interested in completing the requirements for the RESNA Assistive Technology Professional (ATP) Certification or the RESNA Seating and Mobility Specialist (SMS) Certification. A smaller cohort of students includes those enrolled in undergraduate programs who want to become a rehabilitation technician, a rehabilitation technologist or a rehabilitation engineer (Academic Certificate Program Category 2). At OSU we anticipate that the undergraduate students will complete the certificate program in addition to their primary degree program (e.g., health sciences, speech & hearing sciences, biomedical engineering, mechanical engineering). Finally, a small cohort of students enrolled in the graduate program will want to specialize in assistive and rehabilitative technology. At OSU we anticipate that the graduate students will come from the School of Health and Rehabilitation Sciences (athletic training, occupational therapy, physical therapy) (Academic Certificate Program Category 3c). The interprofessional nature of assistive technology will allow us to recruit a wide range of non-degree seeking students who are not currently enrolled at OSU, and create an opportunity to utilize online education to meet the needs of the students.

Projected enrollment (include justification for estimate)
We anticipate a potential enrollment of 150-200 non-degree seeking students and 20-30 degree seeking students per year by the 5th year of the program. The detailed estimates are described in Table 3. We anticipate 100 to 150 post-professional non-degree seeking students from the fields of engineering, occupational therapy, physical therapy, rehabilitation counseling, special education and speech-language pathology. These students may take the entire sequence of courses in order to attain the ARTC and then sit for the ATP and/or SMS exams, or may take individual courses in order to meet their continuing education requirements. We anticipate 40 non-degree seeking students who currently have the ATP Certification and want continuing education credit. They will probably not complete the ARTC, but will be interested in individual courses as part of their continuing education requirements. Finally, we anticipate 20
non-degree seeking students who are specifically seeking the ATP certification in order to become a rehabilitation technician or rehabilitation technologists. In terms of degree-seeking students, we anticipate 20-30 undergraduate and graduate students from OSU. These are students who will complete the certificat program in addition to their primary degree program. The assumed percentage of potential students from engineering is lower than HRS or SHS because they have very few opportunities for taking non-technical electives. The case-mix of undergraduate and graduate students from OSU, post-professional students, and ATPs (current and new) minimizes our risk in meeting enrollment goals. Given the broad case-mix, a strong marketing and communication plan will be critical to the success of the online program.

<table>
<thead>
<tr>
<th>Category</th>
<th>Total #</th>
<th>Assumption</th>
<th>Potential Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRS Health Science - Undergrad</td>
<td>700</td>
<td>2%</td>
<td>44</td>
</tr>
<tr>
<td>HRS Grad (PT/OT/AT)</td>
<td>150</td>
<td>2%</td>
<td>3</td>
</tr>
<tr>
<td>SHS Undergrad</td>
<td>320</td>
<td>2%</td>
<td>6</td>
</tr>
<tr>
<td>SHS Grad</td>
<td>63</td>
<td>2%</td>
<td>1</td>
</tr>
<tr>
<td>BME &amp; ME Undergrad &amp; Grad</td>
<td>300</td>
<td>1%</td>
<td>3</td>
</tr>
<tr>
<td>Post-Professional</td>
<td>1,313,960</td>
<td>0.01%</td>
<td>131</td>
</tr>
<tr>
<td>ATP (current)</td>
<td>4000</td>
<td>1%</td>
<td>40</td>
</tr>
<tr>
<td>ATP (new)</td>
<td>200</td>
<td>10%</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>256</td>
</tr>
</tbody>
</table>

Table 3: Projected enrollment in the ARTC Program
Note 1: Post-professional students include OT, PT, SLP, Special Education, Rehabilitation Counselors, and Engineers. Data based on the US Bureau of Labor Statistics from 2016.
Note 2: The ATP (current) and ATP (new) are based on 2016 numbers from RESNA. There is a turnover rate of ~200 on an annual basis.

Program Learning Outcomes

Undergraduate Academic Certificate Program: Post Bachelor Degree – Category 2

Undergraduate students in the engineering, health science, rehabilitation counseling, education or speech and hearing science programs.

1. Students will be able to identify the characteristics of individuals with disabilities.
2. Students will be able to use assistive and rehabilitative technology devices.
3. Students will be able to distinguish among assistive and rehabilitative technology devices.
4. Students will be able to recognize the assistive technology service delivery process.
5. Students will be able to discuss the assistive technology design process.
6. Students will be able to illustrate of the Human, Activity, Assistive Technology model.

Moved up [4]: Goals of enrollees

The goal of the enrolled students is two-fold: 1) obtain an Assistive Technology Professional (ATP) Certification and Seating and Mobility Specialist (SMS) Certification, and 2) distinguish themselves among their peers in the field. The completion of the certificate program and the attainment of the RESNA certification(s) will distinguish students as competent in the integration of technology for individuals with disabilities. The goals and learning outcomes of the certificate program focus on the application and design of assistive and rehabilitative technology for individuals with disabilities.

Program Goals

Students will understand the role of technology as it relates to individuals with disabilities.
Students will appreciate the AT service delivery process.
Students will learn how to utilize rehabilitative technology in the AT service delivery process.
Students will value the role of an interprofessional collaboration in the AT service delivery process.
7. Students will be able to define the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.
8. Students will be able to appraise emerging technologies in assistive and rehabilitative technology.

Graduate Academic Certificate Program: Post Bachelor Degree – Category 3a
Graduate students in the health sciences (e.g. Occupational Therapy, Physical Therapy), engineering, rehabilitation counseling, or education programs, or non-degree seeking professionals who have the ATP or SMS certifications.

1. Students will be able to identify the characteristics of individuals with disabilities.
2. Students will be able to analyze the unique needs of children, adults, and older adults living with a disability.
3. Students will be able to compare assistive and rehabilitative technology devices.
4. Students will be able to apply assistive and rehabilitative technology devices.
5. Students will be able to illustrate the assistive technology service delivery process.
6. Students will be able to employ the assistive technology design process.
7. Students will be able to generate a case study based on the Human, Activity, Assistive Technology model.
8. Students will be able to assess the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.
9. Students will be able to evaluate emerging technologies in assistive and rehabilitative technology.
10. Students will be able to synthesize multiple technologies for a comprehensive assistive technology solution to meet the needs of an individual.
11. Students will be able to select appropriate outcome measures and performance measures.

Technician / Professional Certification Program – Category 5a
Non-degree seeking professionals who are aspiring to get the ATP and SMS certifications.

1. Students will be able to identify the characteristics of individuals with disabilities.
2. Students will be able to define the general categories of assistive and rehabilitative technology devices.
3. Students will be able to distinguish among assistive and rehabilitative technology devices.
4. Students will be able to recognize the assistive technology service delivery process.
5. Students will be able to discuss the assistive technology design process.
6. Students will be able to recognize the Human, Activity, Assistive Technology model.
7. Students will be able to define the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.

8. Students will be able to give examples of emerging technologies in assistive and rehabilitative technology.

Based on the program goals and learning outcomes, students will be positioned to advance their careers at the intersection of technology for individuals with disabilities. The intersection will transcend technologies: from consumer products designed for the general population to assistive and rehabilitative technology designed specifically for individuals with disabilities.

Employers will seek these students because of their ability to design and integrate technology for individuals for with disabilities. Currently, employers have to train technical students (e.g. engineers) on the ergonomics, biomechanics and human factors applied to individual with disabilities, or they have to train health science and education students on the design and integration of technology for individuals with disabilities. The coursework in the certificate program will meet the educational requirements for the ATP and SMS certification. This certificate program will fill that gap through an interprofessional education model, thereby specifically meeting the requirements of future employers.

The goal of the non-degree seeking student will depend on their level of education and their current employer. For example, a technician for a wheelchair supplier may want the certificate in order to gain promotion within their organization to the position of technologist (aka rehabilitation technology supplier). The ATP certification is required by Medicare and some Medicaid programs to provide high-end wheelchairs. On the other hand, a clinician may want the certificate in order to gain continuing education credit, obtain a promotion within their organization, set themselves apart from their peers, and make it easy for consumers and other assistive technology specialists to recognize them as someone that specializes in assistive technology. The goal of the undergraduate student will be to obtain employment upon graduation from their primary program (e.g. manufacturer, supplier/vendor), apply for a graduate professional program (e.g. MD, OTD, DPT, SLP), or apply for a graduate degree program (e.g. MS, PhD). The certificate will set them apart among their peers in their respective engineering or clinical profession. Like the undergraduate student, the goal of the graduate student is to differentiate themselves among their peers as they seek employment, typically as a clinician, educator or engineer.

Opportunities for graduates

The opportunities are three-fold for graduates of the assistive technology certification program. These opportunities include employment opportunities, graduate school opportunities and job promotion/transition opportunities.

Minimum requirements to undertake program of study: admissions policy

The student must have one of the following minimum requirements in order to enroll in the assistive technology certificate program and complete 5000 level courses for undergraduate credit.
1. Associates degree in the health sciences, education, or engineering technology
2. Enrollment in a bachelor degree granting program in health sciences, education, or engineering
3. Bachelor's degree in programs besides health sciences, education or engineering.

The student must have one of the following minimum requirements in order to enroll in the assistive technology certificate program and complete 5000 level courses for graduate credit.

1. Enrollment in a graduate degree granting program in health sciences, education, or engineering
2. Undergraduate degree in health sciences, education, or engineering.

Program Assessment

The program assessment will be consistent with the School of Health and Rehabilitation Sciences school assessment plan, already in place. Students will be additionally assessed using a post-completion survey that is included in Appendix C.

Resources

We anticipate that we will need 0.55 FTE clinical faculty position and 0.15 administrative assistant position to initiate the certificate program. The clinical faculty position will have 0.45 FTE for teaching responsibilities (15 credits) and 0.10 FTE for program coordination of the AT Certificate Program. We will leverage existing faculty within the School of Health and Rehabilitation Sciences and the Department of Speech and Hearing Sciences to develop and implement the courses. We will leverage an existing faculty member and an existing administrative assistant within the HRS for administration of the AT Certificate program. We will leverage assistive technology device manufacturers, distributors and suppliers for access to technology for online experiential learning. We will include clinicians, educators and individuals with disabilities to provide first-person experiences. Finally, the program coordinator will develop and implement programming, develop online modules, and administer the program.

Initially, we will focus on lecture-based content in order to deliver content to the broadest audience possible. In future iterations of the certificate program, we will develop hands-on components as part of the on-line content, with the expectation that the students will be able to complete the hands-on component in the local setting. This will require collaboration with manufacturers and assistive technology service delivery programs (e.g. rehabilitation center, schools) and resource centers (e.g. tech acts). Eventually, we will develop labs as electives for the certificate program. We will locate the labs both on the OSU campus (local), and in remote locations in collaboration with community partners (e.g. manufacturers, distributors, suppliers, clinics and resource centers). The local labs will be designed for students who are currently enrolled on the Columbus campus, though they will be open to any student that wants to travel to Columbus. The remote labs will allow us to greatly expand our reach and will provide us with an opportunity for developing innovation in the ARTC program curriculum. Based on our
experiences, the hands-on labs tend to be more resource intensive than lectures, therefore we will revisit the need for adequate resources (personnel, equipment and space) prior to initiating the labs.

**Demand**

Demand for this program has been described by the business community, professionals in the field of assistive technology, faculty and students. The assistive technology business community is continuously looking for technicians, technologist and engineers with a clinical background, and clinicians with a technology background. The business community includes manufacturers, suppliers, school districts and rehabilitation centers (inpatient and outpatient). The demand is due to the increasing age of current rehabilitation technicians, technologists and engineers, and due to the increasing numbers of individuals with disabilities. A paucity of academic programs are in place to provide a pathway for the next generation of rehabilitation technicians, technologists and engineers. An AT Certificate program is necessary to replace retiring professionals and to meet the technological needs of individuals with disabilities.

Professionals in the field of assistive technology are constantly looking for continuing education courses in order to maintain their credentials (e.g. licensing, certification). Faculty within OSU acknowledge that there is a need for integrating technology into the lives of individuals with disabilities, and that this program would directly address a gap in the curriculum. Finally, students are seeking to leverage technology with real-world application in their academic programs. The assistive technology certificate program provides an opportunity for degree-seeking students to integrate technology into their primary academic program, and provides non-degree seeking students with the opportunity to apply the coursework into their daily practice. An interprofessional cohort of non-degree seeking and degree seeking students creates an environment where non-degree seeking students can provide real-world case studies, and degree seeking students can leverage knowledge and skills obtained in other courses. The interprofessional education will increase demand for the assistive technology certificate program through organic growth (word-of-mouth) and traditional marketing to students through undergraduate programs, graduate programs and ODEE.

As identified by a review of known assistive technology, rehabilitation technology and rehabilitation engineering university-based programs, there are few programs addressing assistive technology through a certificate programs. This would be the first program of its kind within The Ohio State University. We will leverage existing relationships within the School of Health and Rehabilitation Sciences, and the Departments of Biomedical Engineering, Mechanical and Aerospace Engineering, and Speech and Hearing Sciences to create synergistic relationships that will benefit students, staff and faculty. Most importantly, the interdisciplinary students who complete the interprofessional assistive technology certificate program will be prepared to improve the quality of life of individuals with disabilities through the application of science and technology.
Within the State of Ohio, the only academic program that addresses assistive technology is Bowling Green State University. Bowling Green State University has an online Assistive Technology Certificate Program for graduate students that focuses on the application of assistive technology in the classroom. Ashland University has a partnership with OCALI to utilize OCALI's Assistive Technology Internet Modules (ATIM) as the core component of an online graduate course. Nationally, we identified 23 university-based programs based on a search administered by EduVentures and a review of the RESNA website. Given the paucity of programs nationally, the demand for educational pathways in the field of assistive technology, and large number of potential students, there is a need for an assistive technology certificate program at The Ohio State University.

Competitiveness with other Institutions:

As noted previously, we identified 23 programs in the United States that currently provide a credential in assistive technology. Overall, there is a lack of data on these programs because of the newness of the programs. We anticipate three types of students will enroll in the ARTC Program: non-degree seeking students, undergraduate students enrolled at OSU, and graduate students enrolled at OSU. The largest cohort, and primary focus of the certificate program, includes non-degree seeking students who want to specialize in assistive technology. We anticipate that a smaller cohort of students at OSU will take these courses as electives, therefore the students will maintain their status in their home program (e.g. health sciences, engineering, speech and hearing). In terms of competing with other programs nationally, there are relatively few online certificate programs. Finally, it is important to note that three universities have attained the Rehabilitation Engineering and Assistive Technology Education Accreditation from RESNA. The three universities are the University of Illinois - Chicago, the University of Pittsburgh, and the University of Wisconsin-Milwaukee. All three are part of graduate programs with the goal of providing an MS degree. Though they are not currently direct competitors, we anticipate that some students will be attracted to the programs because of their accreditation status. Given the paucity of programs in the State of Ohio, regionally and nationally, the assistive technology certificate program is positioned to meet the needs of students interested in the field of assistive technology. The greatest challenge will be making students aware of the field, as it is a relatively new field, and is not well known to undergraduate and graduate students. We have an opportunity to leverage two trends among current and future students: working directly with individuals, in this case individuals with disabilities, and leveraging technology to improve the quality of life of individuals.
References

Appendix A

1. Bowling Green State University
   a. Online Master of Education in Special Education with a Specialization in Assistive Technology
   b. Assistive Technology Certificate

2. California State University-Dominquez Hills
   a. Certificate Program Assistive Technology Specialist

3. California State University-Northridge
   a. AT Training Program
   b. MS in Assistive Technology and Human Services (ATHS)
   c. MS in Assistive Technology and Engineering (ATE)

4. California State University-San Diego
   a. Certificate in Rehabilitation Technology

5. Illinois Institute of Technology
   a. Certificate in Rehabilitation Engineering Technology

6. Northern Arizona University
   a. Interdisciplinary Certificate Program in Assistive Technology

7. Rutgers University
   a. Graduate Program in Biomechanics and Rehabilitation Engineering

8. Southern Connecticut State University
   a. M.S. with a concentration in Assistive Technology

9. State University of New York, Buffalo
   a. Advanced Graduate Certificate Program in Assistive and Rehabilitation Technology

10. Stony Brook School of Health Technology and Management
    a. Ph.D. in Health and Rehabilitation Sciences

11. University of Denver
    a. Assistive Technology Partners/Department of Bioengineering

12. University of Illinois at Chicago
    a. Assistive Technology Certificate Program
    b. MS in Disability and Human Development

13. University of Kentucky
    a. Assistive Technology Graduate Programs

14. University of Michigan
    a. Undergraduate Program in Rehabilitation Engineering
    b. Graduate Program in Ergonomics and Rehabilitation Engineering (better website: https://medicine.umich.edu/dept/pmr/programs/rehabilitation-engineering)

15. University of New Hampshire
    a. Graduate Certificate in Assistive Technology

16. University of Pittsburgh
    a. Certificate in Assistive Technology
b. MS in Health and Rehabilitation Sciences with a concentration in Rehabilitation Science and Technology
17. University of Pittsburgh
   a. Rehabilitation Science and Technology Continuing Education
18. University of Wisconsin-Milwaukee
   a. Assistive Technology and Accessible Design Certificate Program
19. University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute
   a. Training and Online Classes
20. Programs in Canada
   a. University of Toronto - NSERC CREATE CARE
   b. Biomedical Engineering Programs in Canada
21. Programs in the United Kingdom
   a. University College London - MSc in Rehabilitation Engineering and Assistive Technologies
Appendix B

**HTHRHSC 5100: Introduction to Assistive Technology (3 credits)** – Instructor: Carmen DiGiovine

Students learn how to develop and implement comprehensive assistive technology (AT) interventions for individuals with disabilities and older adults. Students achieve competency in evaluating clients' technology needs and providing recommendations for appropriate assistive technology and environment modifications to maximize function for individuals living with disability. Students also achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on evidence based-practice. The course addresses both the pediatric and adult population for the development of AT service delivery skills and knowledge. The course includes information on disability, computer access/technology, alternative and augmentative communication, electronic cognitive devices, driver's rehabilitation, low vision technologies, seating and wheeled mobility, electronic activities of daily living, and home automation. The unique needs of children, adults, and older adults are addressed in the home, school, community and vocational settings. This course begins to lay the foundation for an individual interested in the successful completion of the ATP examination.

**HTHRHSC 5400: Computers, Communication and Control for Individuals with Disabilities (3 credits)** – Instructor: Carmen DiGiovine

Students learn how to integrate consumer electronics and assistive technologies for individuals with disabilities and older adults. Students will learn about computer access & technologies, communication devices and devices designed to control the environment. In terms of consumer electronics this includes smartphones, tablets, computers and the internet of things. In terms of assistive technology this includes augmentative and alternative communication, electronic cognitive devices, electronic aids to daily living (aka environmental control units), and accessible user interface hardware and software for computers. The student will integrate these technologies across devices, contexts, settings, activities, and individual characteristics (e.g. capacity and performance). The student will learn about methods for evaluating emerging assistive technology as it relates to computers, communication and control of the environment. Finally, the student will be able to identify key concepts of universal design and engineering design processes. This course builds on the foundation developed in an **HTHRHSC 5100: Introduction to Assistive Technology**, and provides specific content material necessary for the successful completion of the ATP examination.
HTHRHSC 5200: Assistive Technology for Seating and Mobility (3 credits) – Instructor: Carmen DiGiovine

Students are introduced to the concepts of seating and mobility for individuals with disabilities and older adults. Student will learn about different types of mobility devices, ranging from canes, crutches and walkers, to wheelchairs and scooters. They will also learn about different seating systems, ranging from generic planar systems to custom molded systems. They will learn the different types of devices, the purpose for each device, and the appropriate application for each device. Students will achieve competency in understanding methods for assessing capacity and performance while using a mobility device, which includes set-up, configuration and programming. The student will apply the AT service delivery process as it applies to seating and mobility. The course provides the foundation for participation in an interprofessional team focused on seating and mobility, which can be used in industry, research, clinical practice or education This course builds on the foundation developed in an HTHRHSC 5100: Introduction to Assistive Technology, and provides specific content material necessary for the successful completion of the ATP and Seating and Mobility Specialist (SMS) examinations.

HTHRHSC 5450: Assistive Technology for Sports and Recreation (3 credits) – Instructor: Carmen DiGiovine

Students are introduced to the concepts of adapted sports and recreation for individuals with disabilities and older adults. The course will provide a historical overview of sports and recreation for individuals with disabilities from the inception of wheelchair sports to the development of Paralympics and accessible electronic games. The student will learn about the overlap between sports and recreation and assistive technology in terms of devices, the service delivery process, and strategies for inclusion. The students will learn about methods for evaluating adapted sports and recreation technology in terms of safety and application. As adaptive sports and recreation technology is often emerging based on a specific application, we will apply key concepts of universal and engineering design to identify appropriate application of the technology. The course provides the foundation for participation in an interprofessional team focused on sports and recreation, which can be used in industry, research, clinical practice or education This course builds on the foundation developed in an HTHRHSC 5100: Introduction to Assistive Technology, and provides specific content material necessary for the successful completion of the ATP examinations.

Deleted: Augmentative and Alternative Communication (3 credits) – Instructor: Amy Sonntag

Students will gain knowledge in the areas of augmentative communication/augmentative & alternative communication (AAC). The course will explore the assistive technology service delivery process for individuals requiring augmentative communication secondary to a variety of diagnoses. The course will leverage concepts from ‘Introduction of Assistive Technology’. Students will able to recognize categories of AAC devices, features built into AAC Devices, and methods for controlling AAC devices. The student will learn methods for assessing the need for an AAC device, and the effectiveness of the AAC device in facilitating novel communication opportunities. The course provides the foundation for participation in an interprofessional team focused on AAC, which can be used in industry, research, clinical practice or education. This course builds on the foundation developed in an Introduction to Assistive Technology, and provides specific content material necessary for the successful completion of the ATP examination.
## Appendix C

### Undergraduate Stand-Alone Certificate Program Assessment

#### School of Health and Rehabilitation Sciences

**Assistive and Rehabilitative Technology Certificate (ARTC)**
(Undergraduate Stand-Alone Certificate Type 2)

---

**By completing the Assistive and Rehabilitative Technology Certificate (ARTC) Program...**

1. **I am able to identify the characteristics of individuals with disabilities.**

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<thead>
<tr>
<th>Completely Disagree</th>
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2. **I am able to use assistive and rehabilitative technology devices.**

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3. **I am able to distinguish among assistive and rehabilitative technology devices.**

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4. **I am able to recognize the assistive technology service delivery process.**

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<th>Completely Disagree</th>
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5. I am able to discuss the assistive technology design process.

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6. I am able to illustrate of the Human, Activity, Assistive Technology model.

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7. I am able to define the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.

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8. I am able to appraise emerging technologies in assistive and rehabilitative technology.

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## Graduate Stand-Alone Certificate Program Assessment

### School of Health and Rehabilitation Sciences

**Assistive and Rehabilitative Technology Certificate (ARTC)**  
(Graduate Stand-Alone Certificate Type 3a)

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By completing the Assistive and Rehabilitative Technology Certificate (ARTC) Program...

1. I am able to identify the characteristics of individuals with disabilities
   
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2. I am able to analyze the unique needs of children, adults, and older adults living with a disability
   
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3. I am able to compare assistive and rehabilitative technology devices.
   
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4. I am able to apply assistive and rehabilitative technology devices.
   
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5. I am able to illustrate the assistive technology service delivery process.

6. I am able to employ the assistive technology design process.

7. I am able to generate a case study based on the Human, Activity, Assistive Technology model.

8. I am able to assess the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.

9. I am able to evaluate emerging technologies in assistive and rehabilitative technology.

10. I am able to synthesize multiple technologies for a comprehensive assistive technology solution to meet the needs of an individual.
11. I am able to select appropriate outcome measures and performance measures.

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## Technician / Professional Certificate Program Assessment

**School of Health and Rehabilitation Sciences**

**Assistive and Rehabilitative Technology Certificate (ARTC)**

(Technician Professional Certificate Type 5a)

By completing the Assistive and Rehabilitative Technology Certificate (ARTC) Program...

### 1. I am able to identify the characteristics of individuals with disabilities.

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### 2. I am able to define the general categories of assistive and rehabilitative technology devices.

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### 3. I am able to distinguish among assistive and rehabilitative technology devices.

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### 4. I am able to recognize the assistive technology service delivery process.

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### 5. I am able to discuss the assistive technology design process.

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6. I am able to recognize the Human, Activity, Assistive Technology model.

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7. I am able to define the roles and responsibilities of professionals working in the fields of assistive and rehabilitative technologies.

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8. I am able to give examples of emerging technologies in assistive and rehabilitative technology.

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The Ohio State University
College of Medicine
School of Health and Rehabilitation Sciences

HTHRSC 5100 Introduction to Assistive Technology

Course number: HTHRSC 5100
Instructor: Carmen P. DiGiovine, PhD, ATP/SMS, RET
Phone number: 614.293.7876 (DiGiovine)
E-mail: digiovine.1@osu.edu
Office Location: 406 Atwell Hall
Graded: OSU Standard Grading
Format: Online
Credit Hours: 3 hours
When Taught: TBD
Office Hours: TBD

Course Description:
Students learn how to develop and implement assistive technology (AT) devices and services. Students achieve competency in evaluating clients’ technology needs and providing recommendations for appropriate assistive technology to maximize function for individuals living with disability. Students also achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on evidence based-practice. The course addresses both the pediatric and adult population for the development of AT devices and services. The course includes information on disability, computer access/technology, alternative and augmentative communication, electronic cognitive devices, driver’s rehabilitation, low vision technologies, seating and wheeled mobility, electronic activities of daily living, and home automation. The unique needs of children, adults, and older adults are addressed in the home, school, community and vocational settings. This course begins to lay the foundation for an individual interested in the successful completion of the RESNA Assistive Technology Professional (ATP) certification.

Required Text (UG & Grad):

Required Articles (Grad)


Course Goals:
1. Students will gain a general understanding of technology.
2. Students will gain an understanding of disability.
3. Students will understand the interaction between technology and individuals with disabilities.
4. Students will have an understanding of the framework of assistive technology, services, devices, strategies, and practices.

General Course Learning Objectives:
At the conclusion of this course, the student will be able to:
1. Define disability.
2. Define AT in terms of devices, services, practices and strategies.
3. Discriminate among multiple AT devices.
4. Demonstrate the effective utilization of rehabilitation technology.
5. List the different types of AT devices.
6. Define the models and settings of the AT service delivery process.
7. Compare and contrast the different AT service delivery models.
8. Identify the roles of individuals who are associated with the provision of AT.
9. Demonstrate the appropriate documentation of AT services.
10. Discuss AT outcome measures.
11. Accurately represent and articulate the goals of the individual with a disability.
12. Identify potential disparities between the clinician’s goals and the individual with a disability’s goals.
13. Describe the unique needs of children, adults, and older adults living with a disability.
14. Recognize aspects of universal design.
15. Recall ethics and policies of assistive technology.

Graduate Level Course Learning Objectives:
1. Analyze case examples of the key milestones to acquisition of assistive technology (assessment, implementation, training and follow-up).
2. Employ evidence-based practice.
3. Illustrate the processes for the AT service delivery model.
4. Differentiate the roles of individuals who are associated with the provision of AT.
5. Analyze the unique needs of children, adults, and older adults living with a disability.
6. Synthesize multiple technologies for a comprehensive AT solution to meet the needs of an individual.
7. Compare and contrast outcome measures and performance measures.

Assignments:
Quizzes: Identify, define, and apply rehabilitation technology and assistive technology devices and services.
Class Participation – Compare and contrast service delivery models, assistive technologies and rehabilitation technologies.
Final Exam – Identify and recognize key components of AT services, strategies, devices and practices.

Graduate Level Assignments (in addition to above):
Case report(s) based on assistive technology assessment variables – Apply assistive technology service delivery process to case scenarios.
Technology Evaluation(s) based on the assistive technology device review.
Grading Policy

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Graduate Level Grading Policy

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<td><strong>Total</strong></td>
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Quizzes: All quizzes will be on Carmen and will be timed. Dates of when quizzes will be open and closed will be announced. Anyone missing a quiz deadline will receive a reduction in total possible score of one letter grade per day. These will be open book quizzes. It is the student’s responsibility to report to the instructor if there are any problems during the completion of the quizzes.

Class Participation: Students are expected to participate in all class activities. This includes completing all assigned readings and actively participating in online discussions. Students are expected to have questions prepared based on the assigned readings. Students are expected to notify instructors as early as possible by email if they will be unable to participate in a class activity. In the event of an absence it is the student’s responsibility to complete all classwork missed.

Case Reports (Graduate): Case reports will be based on cases provided case studies provided by the instructor. Case reports will follow the assistive technology assessment variables template.

Technology Evaluations (Graduate): The assistive technology / rehabilitation technology device evaluation will follow the assistive technology device review template.

Final Exam: The exam will be online and open book.

Grading Scale:

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<td>65-69</td>
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<tr>
<td>Below 65</td>
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an active OSU email account and remain electronically connected to OSU. Emails may be forwarded to an external email address. Please contact the Help Desk for more information.

Course technology: For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.

Self-Service and Chat support: http://ocio.osu.edu/selfservice • Phone: 614-688-HELP (4357)
Email: 8help@osu.edu • TDD: 614-688-8743

Academic Misconduct: The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism, collaboration on assignments assigned to be independent, using the same work for more than one course, and dishonest practices in connection with examinations and quizzes. The code of student conduct defines plagiarism as “…the representation of another’s work or ideas as one’s own; it includes the unacknowledged word-for-word use and/or paraphrasing of another person’s work, and/or the inappropriate unacknowledged use of another person’s idea.” Students are expected to report to the instructor peers’ actions that they believe to represent academic misconduct.

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Counseling and Consultation Services:
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org

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<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Assistive Technology</td>
<td>Chp 1 EAT [UG &amp; Grad] Andrich et al. (2013) [Grad]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Framework for Assistive Technologies</td>
<td>Chp 2 EAT [UG &amp; Grad]</td>
<td>Quiz: Intro to AT &amp; AT Framework [UG &amp; Grad]</td>
</tr>
<tr>
<td>3</td>
<td>Disability</td>
<td>Chp 3 EAT [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>User inputs</td>
<td>Chp 5 EAT [UG &amp; Grad]</td>
<td>Technology Evaluation #1 [Grad]</td>
</tr>
<tr>
<td>6</td>
<td>Control interfaces</td>
<td>Ch 6 EAT [UG &amp; Grad]</td>
<td>Quiz: Control Interfaces and User inputs [UG &amp; Grad]</td>
</tr>
<tr>
<td>7</td>
<td>Computer Access</td>
<td>Ch 7 EAT [UG &amp; Grad] hill et al. (2015) [Grad]</td>
<td>Case Report #1 [Grad]</td>
</tr>
<tr>
<td>8</td>
<td>Sensory Aids for Persons with Visual Impairments</td>
<td>Ch 8 EAT [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Augmentative and Alternative Communication</td>
<td>Ch 11 EAT [UG &amp; Grad] Baxter et al. (2012) [Grad]</td>
<td>Quiz: ECD &amp; AAC [UG &amp; Grad]</td>
</tr>
<tr>
<td>12</td>
<td>Technologies that Enable Mobility</td>
<td>Ch 12 EAT [UG &amp; Grad]</td>
<td>Quiz: Mobility [UG &amp; Grad]</td>
</tr>
</tbody>
</table>

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EAT – Essentials of Assistive Technology

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Author(s)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Technologies for Transportation and Driving</td>
<td>Dicianno, B. E., &amp; Tovey, E. (2007) [Grad]</td>
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</tr>
<tr>
<td>14</td>
<td>Technologies that Aid Manipulation and Control of the Environment</td>
<td>Liu et al. (2016) [Grad]</td>
<td></td>
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</tbody>
</table>

Quiz: EADL & Computer Access
The Ohio State University  
College of Medicine  
School of Health and Rehabilitation Sciences

HTHRHSC 5200 Assistive Technology for Seating and Mobility

Course number: HTHRHSC 5200
Instructor: Carmen P. DiGiovine, PhD, ATP/SMS, RET
Phone number: 614.293.7876 (DiGiovine)
E-mail: digiovine.1@osu.edu
Office Location: 406 Atwell Hall
Graded: OSU Standard Grading
Format: Online
Credit Hours: 3 hours
When Taught: TBD
Office Hours: TBD
Prerequisite: Introduction to Assistive Technology or Instructor Approval

Course Description:
Students learn how to develop and implement seating and mobility devices and services. Students build on the assistive technology device and service delivery framework introduced in “Introduction to Assistive Technology”. Students achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on seating and mobility. Students will also achieve competency in the understanding and application of different types of mobility devices and seating systems. The course includes information on mobility devices including canes, crutches, walkers, manual wheelchairs, power wheelchairs, scooters and power add-on devices. The course also includes information on seating systems including seat cushions, back supports, and postural supports. Finally, the course will introduce the biomechanical and anthropometric aspects of seating and mobility as it relates to mobility device propulsion and seating system dynamics. This course begins to lay the foundation for an individual interested in the successful completion of the RESNA Assistive Technology Professional (ATP) certification and the Seating and Mobility Specialist (SMS) Certification.

Required Text (UG & Grad):

Required Articles (UG & Grad):
Required Articles (Grad)

Recommended Text:

Course Goals:
1. Students will gain a general understanding of technology.
2. Students will gain a general understanding of seating and mobility systems.
3. Students will understand/analyze the different types of mobility and seating components.
4. Students will understand the interaction between individuals with disabilities and their seating systems.
5. Students will have an understanding of the framework of seating and mobility, services, devices, strategies, and practices.
6. Students will understand the service delivery process for seating and mobility across multiple settings.

General Course Learning Objectives:
At the conclusion of this course, the student will be able to:
1. Define assistive technology in terms of devices, services, practices and strategies.
2. Demonstrate the effective utilization of rehabilitation technology.
3. List the different types of mobility devices.
4. Compare and contrast different types of seating and mobility equipment.
5. Identify the roles of individuals who are associated with the provision of seating and mobility equipment.

6. Demonstrate proper assessment practices (client, physical, seating, mobility, equipment, outcome measures)

7. Demonstrate appropriate documentation

8. Accurately represent and articulate the goals of the individual with a disability

9. Interpret available measurement tools for seating and mobility

10. Recognize the need and process of equipment modifications

11. Understand the integration and customization of technology within seating and mobility

12. Identify the existing/current use of equipment

13. Identify potential disparities between the clinician’s goals and the individual with a disability’s goals.

14. Describe the unique needs of children, adults, and older adults living with a disability.

**Graduate Level Course Learning Objectives:**

At the conclusion of this course, the graduate student will be able to:

1. Analyze case examples of the key milestones to acquisition of seating and mobility devices (assessment, implementation, training and follow-up).

2. Employ evidence-based practice.

3. Differentiate the roles of individuals who are associated with the provision of seating and mobility equipment.

4. Analyze the unique mobility needs of children, adults, and older adults living with a disability.

5. Synthesize multiple technologies for a comprehensive seating and mobility system to meet the mobility needs of an individual.

6. Compare and contrast outcome measures and performance measures.

**Assignments:**

Quizzes: Identify, define, and apply seating and mobility devices and services.

Class Participation – Compare and contrast service delivery models, devices and emerging technologies in seating and mobility.

Final Exam – Identify and recognize key components of seating and mobility services, strategies, devices and practices.

**Graduate Level Assignments (in addition to above):**

Case report(s) based on assistive technology assessment variables – Apply seating and mobility service delivery process to case scenarios.

Seating and mobility technology evaluation(s) based on the assistive technology device review.

**Grading Policy**

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Percentage</th>
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<tbody>
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<td>Quizzes</td>
<td>70</td>
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<tr>
<td>Class Participation</td>
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**Evaluation**

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<td>Final Exam</td>
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<td><strong>Total</strong></td>
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**Graduate Level Grading Policy**

<table>
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<th>Evaluation</th>
<th>Percentage</th>
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<tr>
<td>Quizzes</td>
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<tr>
<td>Class Participation</td>
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<tr>
<td>Case Report</td>
<td>10</td>
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<tr>
<td>Technology Evaluation</td>
<td>10</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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**Quizzes:** All quizzes will be on Carmen and will be timed. Dates of when quizzes will be open and closed will be announced. Anyone missing these items will receive a reduction in total possible score of one letter grade per day. These will be open book quizzes. It is the student’s responsibility to report to the instructor if there are any problems during the completion of the quizzes.

**Class Participation:** Students are expected to participate in all class activities. This includes completing all assigned readings and actively participating in online discussions. Students are expected to have questions prepared based on the assigned readings. Students are expected to notify instructors as early as possible by email if they will be unable to participate in a class activity. In the event of an absence it is the student’s responsibility to complete all classwork missed.

**Case Reports (Graduate):** Case reports will be based on cases provided case studies provided by the instructor. Case reports will follow the assistive technology assessment variables template.

**Technology Evaluations (Graduate):** The assistive technology / rehabilitation technology device evaluation will follow the assistive technology device review template.

**Final Exam:** The exam will be online and open book.

**Grading Scale:**

<table>
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<th>Percent</th>
<th>Grade</th>
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<tr>
<td>93-100</td>
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<td>90-92</td>
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<td>83-86</td>
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<td>B-</td>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of Assistive Technology</td>
<td>Ch 1 EAT [UG &amp; Grad] Andrich et al. (2013) [Grad]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Introduction to Seating and Mobility</td>
<td>Ch 4 &amp; Ch 12 EAT [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Seating &amp; Mobility Service Delivery Process</td>
<td>Armstrong et al (2008) [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Seating and Mobility Assessment Process</td>
<td>Ch 8[UG &amp; Grad] Ch 16 [Grad]</td>
<td>Quiz: Seating and Mobility service delivery and assessment processes [UG &amp; Grad]</td>
</tr>
<tr>
<td>6</td>
<td>Manual Mobility: Independent Propeller</td>
<td>Ch 9[UG &amp; Grad]</td>
<td>Technology Evaluation #1 [Grad]</td>
</tr>
<tr>
<td>7</td>
<td>Manual Mobility: Dependent Propeller</td>
<td>Ch 14[UG &amp; Grad]</td>
<td>Quiz: Manual Mobility [UG &amp; Grad]</td>
</tr>
<tr>
<td>8</td>
<td>Power Mobility: Overview</td>
<td>Ch 10[UG &amp; Grad]</td>
<td>Case Report #1 [Grad]</td>
</tr>
<tr>
<td>9</td>
<td>Power Mobility: Alternative Access Methods</td>
<td>Ch 11[UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Power Mobility: Optimizing Driving and Advanced Applications</td>
<td>Ch 12 &amp; Ch 13[UG &amp; Grad]</td>
<td>Quiz: Power Mobility [UG &amp; Grad]</td>
</tr>
<tr>
<td>13</td>
<td>Mobility Transportation safety</td>
<td>Ch 24[UG &amp; Grad]</td>
<td>Quiz: Mobility Transportation [UG &amp; Grad]</td>
</tr>
<tr>
<td>14</td>
<td>Application of Seating and Mobility: Pediatrics &amp; Adults</td>
<td>Ch 17, 18, 20 [UG &amp; Grad]</td>
<td>Quiz: Application of Seating &amp; Mobility [UG &amp; Grad]</td>
</tr>
</tbody>
</table>

SWM – Seating and Wheeled Mobility  
EAT – Essentials of Assistive Technology
Course number: HTHRSC 5400
Instructor: Carmen P. DiGiovine, PhD, ATP/SMS, RET
Phone number: 614.293.7876 (DiGiovine)
E-mail: digiovine.1@osu.edu
Office Location: 406 Atwell Hall
Graded: OSU Standard Grading
Format: Online
Credit Hours: 3 hours
When Taught: TBD
Office Hours: TBD
Prerequisite: Introduction to Assistive Technology or Instructor Approval

Course Description:
Students learn how to develop and implement assistive technology devices and services which focus on computer, communication and control technologies. Students build on the assistive technology device and service delivery framework introduced in “Introduction to Assistive Technology”. Students achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on computer, communication and control technologies. Students will also achieve competency in the understanding and application of different types of assistive technology. The course includes information on information and communication technologies, control interfaces, electronic aids to daily living, internet of things, zero-effort technologies, educational technologies, and emerging technologies. Finally, the course will introduce the potential use of computer, communication and control technologies as rehabilitation technology, performance measures and outcome measures. This course begins to lay the foundation for an individual interested in the successful completion of the RESNA Assistive Technology Professional (ATP) certification and the Seating and Mobility Specialist (SMS) Certification.

Required Text (UG & Grad):

Required Articles (Grad)


**Recommended Text:**


**Course Goals:**

1. Students will gain a general understanding of computer, communication and control (CCC) technologies.
2. Students will gain a general understanding of technology designed for individuals with a disability.
3. Students will understand/analyze the different types of CCC technologies.
4. Students will understand the interaction between individuals with disabilities and CCC technologies.
5. Students will understand the framework of CCC technologies services, devices, strategies, and practices.
6. Students will understand the service delivery process for CCC technologies across multiple settings.
7. Students will gain a general understanding of the use of CCC technologies for rehabilitation technology, performance measures and outcome measures.

**General Course Learning Objectives:**

At the conclusion of this course, the student will be able to:

1. Define assistive technology in terms of devices, services, practices and strategies.
2. Demonstrate the effective utilization of rehabilitation technology.
3. List the different types of CCC technologies.
4. Compare and contrast different types of CCC technologies.
5. Identify the roles of individuals who are associated with the provision of CCC technologies.
6. Demonstrate proper assessment practices (client, physical, technology, outcome measures)
7. Demonstrate appropriate documentation
8. Accurately represent and articulate the goals of the individual with a disability
9. Interpret available measurement tools for CCC technologies
10. Recognize the need and process of equipment modifications
11. Understand the integration and customization of technology within CCC technologies
12. Identify the existing/current use of equipment
13. Describe the unique needs of children, adults, and older adults living with a disability.
14. Recognize the application of emerging technologies as CCC technologies.

Graduate Level Course Learning Objectives:
At the conclusion of this course, the graduate student will be able to:
1. Analyze case examples of the key milestones to acquisition of CCC technologies (assessment, implementation, training and follow-up).
2. Employ evidence-based practice.
3. Differentiate the roles of individuals who are associated with the provision of CCC technologies.
4. Analyze the unique needs of children, adults, and older adults living with a disability when utilizing information and communication technologies, and electronic aids to daily living.
5. Synthesize multiple technologies for a comprehensive information and communication system to meet the work, school or community needs of an individual.
6. Compare and contrast outcome measures and performance measures.

Assignments:
Quizzes: Identify, define, and apply CCC devices and services.
Class Participation – Compare and contrast service delivery models, devices and emerging technologies in CCC.
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Grading Policy

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<tbody>
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**Graduate Level Grading Policy**

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Self-Service and Chat support: http://ocio.osu.edu/selfservice • Phone: 614-688-HELP (4357)
Email: 8help@osu.edu • TDD: 614-688-8743

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<th>Topic</th>
<th>Readings</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of Assistive Technology</td>
<td>Ch 1 AT:P&amp;P [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Andrich et al. (2013) [Grad]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Making the Connection: User Inputs &amp; Control Interfaces for Assistive Technologies</td>
<td>Ch 6 &amp; 7 AT:P&amp;P [UG &amp; Grad]</td>
<td>Quiz: User Inputs &amp; Control Interfaces [UG &amp; Grad]</td>
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<tr>
<td></td>
<td></td>
<td>Holmqvist et al (2017) [Grad]</td>
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<tr>
<td></td>
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<td>Chaudhary et al (2016) [Grad]</td>
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<tr>
<td>3</td>
<td>Accessing Mainstream Information and Communication Technologies: The Technology and the Web</td>
<td>Ch 8 AT:P&amp;P [UG &amp; Grad]</td>
<td>Quiz: Information and Communication Technologies [UG &amp; Grad]</td>
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<tr>
<td>4</td>
<td>Technologies That Aid Manipulation and Control of the Environment</td>
<td>Ch 12 AT:P&amp;P [UG &amp; Grad]</td>
<td>Quiz: Electronic Aids to Daily Living [UG &amp; Grad]</td>
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<td></td>
<td>Cogollor et al (2018) [Grad]</td>
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<tr>
<td>6</td>
<td>Introduction to Zero-Effort Technologies</td>
<td>Ch 1 ZET [UG &amp; Grad]</td>
<td>Technology Evaluation #1 [Grad]</td>
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<tr>
<td>7</td>
<td>Designing, Building and Evaluating ZETs</td>
<td>Ch 2 &amp; 3 ZET [UG &amp; Grad]</td>
<td>Quiz: Zero Effort Technologies [UG &amp; Grad]</td>
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<tr>
<td>8</td>
<td>Fundamentals of Robotic Assistive Technologies</td>
<td>Ch 1 RAT [UG &amp; Grad]</td>
<td>Case Report #1 [Grad]</td>
</tr>
<tr>
<td>9</td>
<td>Human-Robot Interaction for Rehabilitation Robots</td>
<td>Ch 2 RAT [UG &amp; Grad]</td>
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<tr>
<td>10</td>
<td>Assisitive Robotic Manipulators</td>
<td>Ch 3 RAT [UG &amp; Grad]</td>
<td>Quiz: Robotic Assistive Technologies #1 [UG &amp; Grad]</td>
</tr>
<tr>
<td>11</td>
<td>Robotic Systems for Augmentative Manipulation to Promote Cognitive Development, Play and Education</td>
<td>Ch 7 RAT [UG &amp; Grad]</td>
<td>Technology Evaluation #2 [Grad]</td>
</tr>
<tr>
<td>Week</td>
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<tr>
<td>12</td>
<td>Social Assistive Robots for Children with Complex Disabilities</td>
<td>Ch 8 RAT [UG &amp; Grad]</td>
<td></td>
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<tr>
<td>13</td>
<td>Robots Supporting Care for Elderly People</td>
<td>Ch 9 - RAT [UG &amp; Grad]</td>
<td>Case Report #2 [Grad]</td>
</tr>
<tr>
<td>14</td>
<td>Ethical and Social Implications of the Use of Robots in Rehabilitation Practice</td>
<td>Ch 10 RAT [UG &amp; Grad]</td>
<td>Quiz: Robotic Assistive Technologies #2 [UG &amp; Grad]</td>
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</tbody>
</table>

RAT - Robotic Assistive Technologies: Principles and Practice  
AT:P&P - Assistive Technologies: Principles and Practice  
ZET - Zero-effort technologies: considerations, challenges, and use in health, wellness, and rehabilitation
HTHRHSC 5450 Assistive Technology for Sports and Recreation.

**Course number:** HTHRHSC 5450

**Instructor:** Carmen P. DiGiovine, PhD, ATP/SMS, RET

**Phone number:** 614.293.7876 (DiGiovine)

**E-mail:** digiovine.1@osu.edu

**Office Location:** 406 Atwell Hall

**Graded:** OSU Standard Grading

**Format:** Online

**Credit Hours:** 3 hours

**When Taught:** TBD

**Office Hours:** TBD

**Prerequisite:** Introduction to Assistive Technology or Instructor Approval

**Course Description:**

Students learn how to develop and implement assistive technology devices and services which focus on adapted sports and recreation. Students build on the assistive technology device and service delivery framework introduced in “Introduction to Assistive Technology”. Students achieve competency in understanding the assistive technology service delivery process in multiple environments, with a focus on adapted sports and recreation technology. Students will also achieve competency in the understanding and application of different types of assistive technology that integrate with sports and recreation. The course includes information on the technology used in Paralympic sports, summer sports (e.g. wheelchair court sports, water sports), winter sports (e.g. skiing), video games, and recreation (e.g. camping). The course will review principles of anthropometrics, biomechanics and ergonomics as it applies to sports and recreation for individuals with disabilities. Finally, the course will introduce the potential use of adapted sports and recreation technologies as rehabilitation technology, performance measures and outcome measures. This course begins to lay the foundation for an individual interested in the successful completion of the RESNA Assistive Technology Professional (ATP) certification and the Seating and Mobility Specialist (SMS) Certification.

**Required Text:**


**Recommended Text:**


Course Goals:
1. Students will gain a general understanding of adapted sports and recreation (ASR).
2. Students will gain a general understanding of technology designed for individuals with a disability.
3. Students will understand/analyze the different types of ASR technologies.
4. Students will understand the interaction between individuals with disabilities and ASR technologies.
5. Students will understand the framework of ASR technologies services, devices, strategies, and practices.
6. Students will understand the service delivery process for ASR technologies across multiple settings.
7. Students will gain a general understanding of the use of ASR technologies for rehabilitation technology, performance measures and outcome measures.

General Course Learning Objectives:
At the conclusion of this course, the student will be able to:
1. Define assistive technology in terms of devices, services, practices and strategies.
2. Demonstrate the effective utilization of rehabilitation technology.
3. List the different types of ASR technologies.
4. Compare and contrast different types of ASR technologies.
5. Identify the roles of individuals who are associated with the provision of ASR technologies.
6. Demonstrate proper assessment practices (client, physical, technology, outcome measures)
7. Demonstrate appropriate documentation
8. Accurately represent and articulate the goals of the individual with a disability
9. Interpret available measurement tools for CCC technologies
10. Recognize the need and process of equipment modifications
11. Understand the integration and customization of technology within ASR technologies
12. Identify the existing/current use of equipment
13. Describe the unique sports and recreation needs of children, adults, and older adults living with a disability.
14. Recognize the application of emerging technologies as ASR technologies.

Graduate Level Course Learning Objectives:
At the conclusion of this course, the graduate student will be able to:
1. Analyze case examples of the key milestones to acquisition of ASR technologies (assessment, implementation, training and follow-up).
2. Employ evidence-based practice.
3. Differentiate the roles of individuals who are associated with the provision of ASR technologies.
4. Analyze the unique needs of children, adults, and older adults living with a disability when utilizing ASR technologies.
5. Select, apply and interpret anthropometric and biomechanical measures.
6. Compare and contrast outcome measures and performance measures.

Assignments:
Quizzes: Identify, define, and apply ASR devices and services.
Class Participation – Compare and contrast service delivery models, devices and emerging technologies in ASR.
Final Exam – Identify and recognize key components of ASR services, strategies, devices and practices.

Graduate Level Assignments (in addition to above):
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<tr>
<td>2</td>
<td>Adapted Sports and Recreation</td>
<td>Wilson &amp; Clayton (2010) [UG &amp; Grad]</td>
<td>Quiz: Adapted Sports and Recreation [UG &amp; Grad]</td>
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<td>3</td>
<td>Adapted Sports Technology</td>
<td>Jaarsma et al (2014); DeLuigi &amp; Cooper (2014); Cooper &amp; DeLuige (2014)</td>
<td>Quiz: Adaptive Sports and Recreation &amp; Technology [UG &amp; Grad]</td>
</tr>
<tr>
<td>4</td>
<td>Physical Activity for Children with Disability</td>
<td>Shields et al (2011) [UG &amp; Grad]</td>
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<tr>
<td>5</td>
<td>Exercise &amp; Training</td>
<td>Martin Ginis et al. (2017); Simim et al (2017) [UG &amp; Grad]</td>
<td>Quiz: Exercise &amp; Training [UG &amp; Grad]</td>
</tr>
<tr>
<td>6</td>
<td>Paralympic sports</td>
<td>Willicak &amp; Lexell (2014); Goosey-Toffrey (2010); Burkett (2010) [UG &amp; Grad]</td>
<td>Technology Evaluation #1 [Grad]</td>
</tr>
<tr>
<td>9</td>
<td>Wheelchair Court Sports</td>
<td>Paulson &amp; Coosey-Toffrey (2017); Mason et al (2014) [UG &amp; Grad]</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Wheelchair Racing Track and Field</td>
<td>Blauwet et al (2016); Rice et al (2015); Cooper (1990) [UG &amp; Grad]</td>
<td>Quiz: Wheelchair Sports [UG &amp; Grad]</td>
</tr>
<tr>
<td>11</td>
<td>Classification for adapted sports</td>
<td>van der Slikke (2017); Vanlandewijck et al (2011) [UG &amp; Grad]</td>
<td>Quiz: Classification [UG &amp; Grad]</td>
</tr>
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