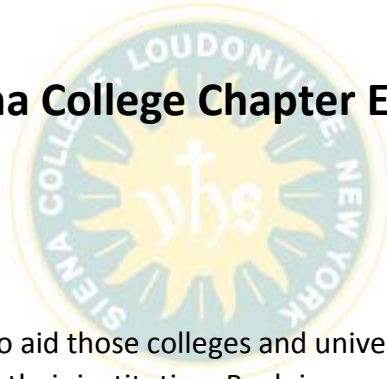


## e-NABLE Siena College Chapter Establishment



This document is meant to aid those colleges and universities that wish to establish a chapter of Enabling the Future at their institution. By doing so, those involved with the process will volunteer their time to give those in need a “Helping Hand”. This official establishment allows the institution to formally invite e-NABLERS to come together for a common cause to provide 3D printed prosthetic devices for recipients all over the world. Although institutions are involved with the e-NABLE process currently, forming a nationally recognized chapter at the institution aids in the spread of their influence and recognition from outside sponsorship.

Formulated below are the steps in which one would go about starting a structured chapter of Enabling the Future:

1. Beginning with individual or group leadership, go about educating yourself and others that are interested, about the different aspects of e-NABLE including, but not limited to:
  - Their different prosthetic device models
  - The matching process between fabricator and recipient
  - The different materials and tools needed to build the devices
  - The different ways in which individuals and groups can get involved
  - The reasons and ambitions that brought e-NABLE to where it is today
2. Once you have established an understanding of the different components of e-NABLE, begin assembling a team of passionate volunteers that are interested in getting involved. Please make it clear that ANYONE can join the team regardless of their educational background or interests. There are several ways in which people can get involved with the process and everyone that would like to join this community are welcome.
3. From here you will need to find a 3D printer within your university or at a nearby makerspace that will allow you to produce the prosthetic devices. At this stage, it would be worth your time to start asking your university how they might be able to fund the needed costs for the projects that you will be undertaking. You may even want to set up your own ways to raise money or look for outside sponsorship from companies that are engineering or technology related.
4. After you have assembled the necessary tools and materials needed to print your first test hand, determine which hand you will print and customize it to your liking. When it is finished printing, watch the example videos on e-NABLE’s website to start to understand the assembly process.

5. Once you have assembled the test hand, submit it to e-NABLE for an initial examination to make sure that you are able to produce a quality print for a recipient.
6. Following an ok from the organization, get in contact with one of the Matchers to begin your collaborative relationship with a recipient.
7. After you are paired with a recipient, use the pictures provided to accurately size a usable prosthetic with the certain customization guidelines provided by the recipient.

Once you have gone through these steps, you will be at the point to deliver the 3D printed prosthetic to the recipient! At this stage you may want to look into how you can spread your influence by contacting nearby schools with engineering and technology related programs to begin partnerships. For any questions or concerns about how to start your own chapter of e-NABLE or how to go about any of these steps related to designing and producing the 3D printed prosthetics, you can look online or contact an e-NABLE representative at [enablingthefuture.org](http://enablingthefuture.org).

Here is a look at one of Siena College's success stories:

### **IRON MAN JACK CARDER – 3D Printed Prosthetic Iron Man Themed Hand**

Jack Carder is your typical rowdy and enthusiastic five year old boy, who idolizes Marvel superheroes and can name every player on his favorite baseball team, the Cleveland Indians, as well as model their batting stances. He is just a happy-go-lucky kid that has already overcome certain obstacles in his short life. Jack was born with a hand anomaly in that his fingers never fully formed on his right hand. Today, Jack has a usable thumb due to bone graft surgery, however his four other fingers are still useless to him. In order to pick up objects, he pinches them with his thumb against his palm. As an active and growing young lad, his parents wanted to find a way for him to use a prosthetic hand that would grow with him, be able to perform daily tasks, and yet be cost effective and practical.

This is where Enabling the Future and my involvement with the organization comes in. e-NABLE is a global volunteer community that designs 3D printed prosthetic hands, arms, and fingers for those in need. Since forming the non-profit organization in July 2013, e-NABLE has grown to 5,300 members worldwide and has reached out to countless families. As a senior physics major at Siena College, I have come to be involved with e-NABLE because I would like to study Biomedical Engineering and specialize in prosthetic research and development by pursuing a M.S. leading into a Ph.D. I initially got involved with e-NABLE so that I could tie in what I had learned during my undergrad to reaching out to my community and give those in need a "Helping Hand". In order to do this, I established a student driven chapter at Siena in early March 2015 that is now composed of 13 students covering every year level with backgrounds in physics, chemistry, and finance.

Through e-NABLE's matching process, we were quickly introduced to Jack and his family that are from Columbus, Ohio. Over the course of the past two months, my team and I have been collaborating with the family to take measurements, pictures, and video of Jack's affected right hand so that we could design, print, and assemble him a functional and practical prosthetic hand. With the help of the open source designs that e-NABLE currently has and the ability of full customization from 3D printing, we were able to meet Jack's only wish, that his hand be Iron Man themed. We gave him just that! With a yellow and red color scheme, glow in the dark accents, and a palm "laser", Jack was ecstatic to receive the finished product on April 21, 2015. Three other team members and I personally delivered the hand to Jack that Tuesday in Columbus, first at his school, then at the Columbus Clippers baseball game later that night as he got to throw out the first pitch. Seeing his emotions as he got to try out his new prosthetic hand was a humbling experience because at that moment, we knew we were making an impact in this little guy's life.

The practicality of 3D printed prosthetics especially when implemented in young children leads to amazing opportunities in terms of the customization and usefulness for the recipient. As Jack grows we will be keeping in contact with him so that we can build him another hand to the right specifications. Also, if he breaks the hand, we can always just print him another one. To add to that, we donated the hand to Jack, so there is no cost to his family and he receives a prosthetic that is usable and practical for a kid his age. He told us that for his next hand he wants it to be Wolverine themed, and we're already preparing designs for when that time comes!

At the moment, we have also just finished designing a hand for a 38 year old man in New Orleans, LA and have recently sent it out to him. Having recently graduated from Siena, I hope to stay on with the e-NABLE chapter as a mentor for new students that join the team as they continue to help recipients in the future. With this experience I have gained a lot of valuable knowledge regarding 3D printing and the construction of prosthetics. I plan on designing my own hand for e-NABLE this summer, and hopefully see that it becomes one of their more popular designs.

Here are some links to our e-NABLE Siena College chapter, as well as pictures of Jack with his hand and news releases that covered our story:

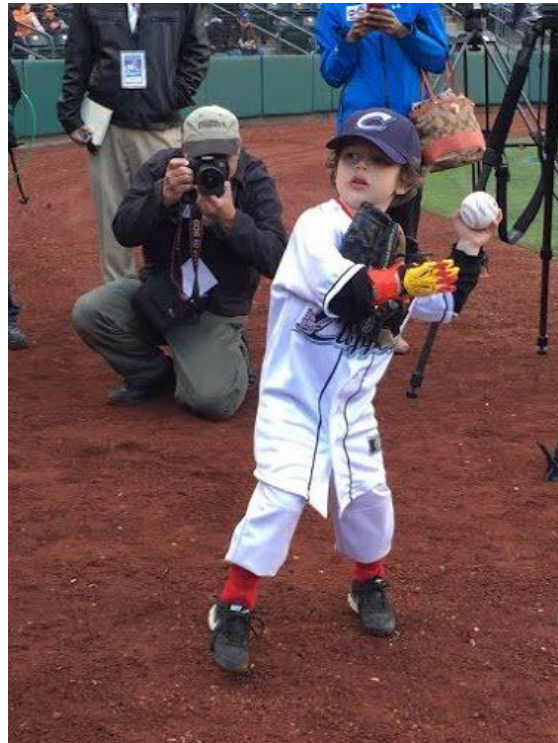
Website: [enablesiena.org](http://enablesiena.org)

Facebook: <https://www.facebook.com/ENABLESIENACOLLEGE>

Twitter: @ENABLESiena

Instagram: @enablesiena





Check out the media hits here:

<http://abcnews.go.com/US/ohio-boy-printed-iron-man-prosthetic-hand-throws/story?id=30498873>

<https://gma.yahoo.com/video/iron-man-boy-amazes-first-142104756.html>

<http://www.cbssports.com/mlb/eye-on-baseball/25159757/watch-5-year-old-receives-cool-prosthetic-hand-throws-out-first-pitch>

<http://www.nydailynews.com/life-style/health/boy-prosthetic-iron-man-hand-throws-pitch-article-1.2195537>

<http://www.complex.com/sports/2015/04/five-year-old-kid-throws-out-first-pitch-with-prosthetic-hand>

<http://www.timesunion.com/news/article/Siena-students-make-Iron-Man-prosthetic-hand-for-6211614.php>

<http://wnyt.com/article/stories/s3771911.shtml>

<http://news10.com/2015/04/20/local-college-students-create-an-iron-man-prosthetic-hand-for-a-5-year-old-boy-in-need/>

<http://abcnews.go.com/GMA/video/iron-man-prosthetic-hand-boy-amazes-baseball-pitch-30498993>

<http://m.cbs6albany.com/article?id=17944638&categoryid=315&election=&provider=>

<http://www.995theriver.com/onair/kevin-shanna-25/tell-us-good-stuff-joey-fairley-13532848>

<http://www.si.com/extra-mustard/video/2015/04/23/5-year-old-jack-carder-throws-out-first-pitch-bionic-hand>

<http://www.nbc4i.com/story/28850303/college-kids-use-3d-printer-to-give-boy-a-new-hand>