In January 2012, through the aid of funding from the Massachusetts Department of Elementary and Secondary Education Race to the Top award, UMass Lowell launched UTeach. This nationally acclaimed teacher preparation program, which began at The University of Austin, Texas, has been replicated by 44 universities across the United States. When we began with the first UTeach course, STEP 1, we had 26 students and eight mentor teachers from two school districts. Now three years in, we have had over 200 students participate in the program, we have graduated eight teachers, and we work with over 50 mentor teachers from nine school districts. We have also been privileged to receive generous donations from Cabot Cooperation, United Technologies, Red Hat, Parker Foundation, Penny Demogenes Estate, and Greater Lowell Community Foundation. We have enjoyed three very productive years on the grant, and look forward to preparing the next generation of science and math teachers for many more years to come.
Preparing teachers who are effective with knowledge, skills, and dispositions that will enable them to succeed in their profession, and make a difference to the lives of the students they teach, is the primary goal of UTeach UMass Lowell.

When we began in January 2012, we did not anticipate that two years later we would be graduating our first two teachers. Eduardo Beato and Daniel Packard, both math majors, graduated in 2014 as certified High School Math Teachers.

Both Eduardo and Daniel are now employed as math teachers. Eduardo, who carried out his practicum at Lowell HS, is now employed at Chelmsford High School, and Daniel is employed at the school where he carried out his practicum, Greater Lowell Technical HS.

Working with practicum students is indeed a pleasure for us. We get to observe our UTeach interns put into practice what we have taught them throughout the UTeach program. More importantly, we see them grow and mature into professional teachers. This year we saw six of our UTeach interns do just that—graduate as the next generation of effective science and math teachers.

Alicia Negron, biology major, Nicholas Rossetti, Alex Pham, Stephanie Bellerose, Anna Baturin, and Jessica Flynn, who are all math majors, graduated this year as High School science and math teachers.

Alicia, Anna, and Stephanie will begin their teaching career at Lowell High School. Alicia as a biology teacher and Stephanie and Anna as math teachers.

Jessica has decided to continue on at Umass Lowell to complete her Masters Degree in Mathematics before pursuing her teaching career. Finally Nick and Alex have interviews lined up, and we have confidence that they too will soon find employment as math teachers.
Cabot Corporation is a leading global specialty chemicals and performance materials company. They serve key industries such as transportation, infrastructure, environment and consumer products.

In 2013, Cabot Corporation, located in Billerica MA, made a generous donation to UTeach UMass Lowell. This was the same year UTeach STARS were launched. This Initiative and led by Dr. Eliza Bobek, UTeach STARS is centered around giving our UTeach interns the opportunity to provide a service (working as a math/science tutor or teaching assistant) to local schools.

Students commit two hours a week for 10 weeks at a local elementary, middle, or high school. With the assistance of the Cabot Corporation’s kind donation, we were able to honor these students with a $350 stipend for their commitment to community service.

Now referred to as UTeach Cabot STARS, we have reached out to many schools, and schools have reached out to us asking for our UTeach interns to assist in math, science classrooms as well as in afterschool activities such as preparing middle school students for science or engineering fairs.

In the summer of 2014, six of our UTeach interns participated for four weeks working with students at Lowell High Summer School. The UTeach interns, who were also funded through funding received from Cabot Corporation, were involved in designing and implementing inquiry-based lessons to teach mathematics, biology, chemistry, and computer science.

This summer we are delighted to have three of our UTeach interns, Marissa Asa, Alicia Negron, and Brad Marshall, assisting as camp supervisors.

UTeach UMass Lowell already has a strong relationship with the TIHC through the UTeach course Project Based Instruction (PBI). Once again, the students’ internships are the result of funding received by Cabot Corporations.
It is a well known fact that the US has a shortage of effective STEM teachers. UTeach UMass Lowell’s mission is to prepare such effective STEM teachers, who not only have strong content knowledge, but also have the pedagogical experience needed to be proficient in their careers as teachers, and remain in the profession thereby raising the standard of achievement of students so that they are well prepared to live, contribute, and be successful in a global economy.

As UTeach UMass Lowell is dedicated to helping improve the quality of K-12 STEM education, we rely on donors to fund internships and scholarships so that the undergraduate STEM majors can complete the program. We also rely on funding from our donors to purchase materials for the UTeach interns to use in elementary, middle and high school classrooms where they implement their lessons, and pay our mentor teachers a small stipend for willingly giving their time to help the UTeach interns.

We thank the following donors for their generous donations:

- Cabot Corporations
- United Technologies
- Penny Demogenes Estate
- Red Hat of Westford
- Janis Ranguin

We also thank the following donors for their donations to supply the local school districts with math tutors:

- Parker Foundation
- Greater Lowell Community Foundation

Additionally, we have endowed scholarship money which is used for UTeach scholarships.

- Alice Fluery Zamanakos
- Mary, Joan and Nancy Scholarship for Courage and Compassion
- Margaret Holland Barrett
- Mary Curtin Alden
- GSE Advisory Board
- Class of 1962
- Philip F Riley

Congratulations to the following students who were nominated for, and received scholarships:

- **Clint Perry** (Mary Curtin Alden Scholarship)
- **Adam Pandolph** and **David Entwistle** (Margaret Holland Barrett Teaching Scholarship)
- **Michael Manser** (Class of 1962 Education Scholarship)
- **Rachel Bryan, Christine McCarthy, Lizbert Acosta, Lynasy Heng, Andrea Larson, Ashley Bretton, and JoAnn Plante** (all of them received funding from Alice Fluery Zamanakos Scholarship)
- **Samuel Bouchard** (GSE Advisory Board Scholarship)
- **JoAnne Plante** (Mary, Joan and Nancy Scholarship for Courage and Compassion)
- **Bradley Marshall** (Nettie Ginsburg Altshuler Memorial Scholarship)
- **Matthew D’ Angelo** (Joseph J. and M. Jean Donnelly Education Fund)
UTeach Courses

The success of any program comes from reshaping rather than reinventing. Not only do we continuously reshape the UTeach UMass Lowell courses to meet the needs of UML students, we have re-shaped the structure of our program. To allow more students to take UTeach courses and complete their degree, we have made it possible for students to complete their courses and graduate with their STEM degree and STEM Teaching Minor in four years.

The practicum is a crucial component of any teacher preparation program. UTeach students complete the practicum component only if they wish to be licensed to teach. It is possible to graduate with the STEM Teaching Minor with or without the practicum. The practicum can be completed during the year after graduation. We hope this will allow more students, especially the engineering students, to complete their degree and then get their license to teach.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>UTL.101</td>
<td>Step 1: Inquiry Approaches to Teaching (1 credit)</td>
</tr>
<tr>
<td>UTL.102</td>
<td>Step 2: Inquiry Based Lesson Design (1 credit)</td>
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All students begin exploring teaching by enrolling first in STEP 1 and then in STEP 2. Both courses are field based and the students experience teaching elementary grades and middle grades respectively.

If students decide that teaching is for them, then they enroll in the STEM Teaching Minor and continue gaining more school-based experiences. In Interactions and Equity, students learn what teaching is like at High School for the first time. Then in Project-Based Instruction, the students experience planning a unit of work as a project, and take a group of students out on a field trip at the Tsongas Industrial History Center. In Teaching ELLs, the students tutor ELL students.

In addition to the above courses math students are expected to complete two extra courses, both offered as math electives.

Finally, to receive their Initial Teacher’s license, the students complete a 14 week Practicum, where they put all that they have learned into practice.

Faculty UTeach Advisors

Deciding how to schedule the UTeach courses in with the courses required to complete their chosen STEM major can be a daunting task for undergraduate students. In order to make this process smoother and painless for the students, UTeach UMass Lowell work closely with committed supportive faculty from Biology (Dr. Naomi Wernick), Chemistry (Dr. Leslie Farris), Physics (Dr. Nikolay Lepeshkin), Mathematics (Professor James Graham-Eagle), and Engineering (Professor David Kazmer, also UTeach Co-Director).

Faculty UTeach Advisors have been phenomenal in advising students in the UTeach Program as well as recruiting students into the UTeach program.
At the end of spring semester 2014, UTeach UMass Lowell recruited four students, David Entwistle (Physics major), Alicia Negron (Biology major), Jasmin Moran (Computer Science Major), and Clint Perry (Electrical Engineering major) as the UTeach Ambassadors.

UTeach Ambassadors are UTeach students enrolled in courses beyond Step 1. They are passionate about teaching, and embrace what UTeach has to offer. They are also confident, flexible, pro-active, have excellent communication and interpersonal skills, and are able to present themselves well to the public.
What do the UTeach ambassadors do?

The Ambassadors visit classrooms to speak of their experiences with UTeach and why they stayed with the program, and they represent UTeach at various events such as at the Open House, Convocation, Evening with Scholars and Career Fairs. In addition, the Ambassadors play a big role in retaining students and encouraging them to move forward with the UTeach courses. They do this through helping out in STEP 1 classes, judging the STEP 1 poster competition, and organizing social events. As a result of the efforts of the UTeach Ambassadors, we saw more students entering the STEP 1 course and moving forward into STEP 2.

STEP 1 Poster Presentation
Fall 2014 and Spring 2015

Billerica High Careers Fair March 2015

At the Billerica High School Careers fair the Ambassadors were not only invited to speak to the students about UTeach, but also about life as a student at UMass Lowell. The Ambassadors have been a great asset to UTeach UMass Lowell, and we look forward to involving the Ambassadors in other activities to increase UTeach UMass Lowell’s in-campus and off-campus presence. As we move forward, we are joined by two new Ambassadors—Jacob Stephens (Computer Science) and Jamie Richards (Biology).
STEP 1—Inquiry Based Lesson Design is the first of the UTeach courses. Over the last three years this course has been reshaped to make it a wonderful learning experience for the students. The poster presentation is the highlight of the course. It has always been well attended by the students, the UTeach Faculty Advisors, the UTeach Co-PIs, and sometimes even parents.

As well as being a learning experience, where each student visits another group’s poster and assess their work, the STEP 1 students from all sections of the course offered during the semester get to interact with each other and socialize.

The posters presented by the students features one of their lessons, which they had planned and implemented and considered to be their strongest lesson of the semester. The posters are therefore carefully and painstakingly put together by each student with enthusiasm, passion and pride.
Project-Based Instruction—Field Trip Highlights

Project-Based Instruction (or PBI) is one of the last UTeach course students take before moving onto complete their Practicum. In the Fall of 2014, Dr. Michelle Scribner-MacLean led this course for the second time with 11 students and Melinda Willis as her teaching assistant.

The students worked with mentor teachers from Billerica High School, Greater Lowell Technical HS, and Windham High School in New Hampshire and designed projects with the field trip component at the Tsongas Industrial History Center.

George Katsaros and Alex Pham planned a math project where students used the ‘workers on line’ room.

Michael Benoit and Emily Adey planned a math project investigating geometric transformations in the weave room.

Alicia Negron and Adam Pandolph used the lab to investigate the question ‘Would you drink water from the Merrimack River?’

David Entwistle used the ‘Power to Production’ room and equipment to investigate physics of water wheels and water pressure.

In PBI, the UTeach students design projects framed by an overarching problem or question where students are engaged in a rigorous, extended process of asking questions, finding resources, and applying information. In designing projects the UTeach interns utilize all they have learned throughout the program leading students to make decisions about their project, appealing to their personal concerns and interests. In addition, the UTeach interns and the students they teach reflect on the learning outcomes, the effectiveness of the inquiry and project activities, the obstacles and how to overcome them. PBI is a popular course with our UTeach interns. During PBI, we observe transformation of the UTeach students as they develop and grow as science/math teachers.
The UTeach conference is an annual event hosted by the UTeach Institute in Austin, TX. This is where faculty, master teachers, and students from replication sites meet to share ideas and collaborate with each other.

In 2014, we took two students to represent UTeach UMass Lowell at the conference, John Romano and Erinn McLaughlin, who were both math majors. Erinn presented her PBI project, John presented his poster on the work he carried out with M2D2 and Lowell High School.

At the conference, John Romano received an award for the best research poster. “The judges were compelled by the idea, organization and execution of the project,” stated Julia Lee, instructional support coordinator at UTeach Institute. “John gave clear, concise and expert verbal explanations of his project. Plus, the project was just awesome. The students created something useful.”

John had worked with students at Lowell High School to build a prototype of a smartphone case that could house biometric sensors, such as heart rate, blood pressure and temperature. The project team found that physicians and EMTs need access to data from medical devices in one central place.

This year, to represent UMass Lowell we took two of our graduates and two of our students, who are at various stages of the program. Alicia Negron and Anna Baturin, the two graduates, presented posters of their PBI projects and led an interactive seminar to students from other UTeach replication sites on their experience with UTeach courses and how these courses prepared them for their practicum. David Entwistle and Clint Perry, also presented posters, and captivated the master teachers with their dedication to UTeach by presenting their work as UTeach Ambassadors.

Although this year there were no prizes for best posters, the students had a lot of fun presenting their posters and talking about their work with passion and enthusiasm to all those who stopped by to admire their posters.
Every year in November, just before Thanksgiving, UTeach UMass Lowell hosts a dinner for all our partners—mentor teachers, school administrators, UTeach Faculty Advisors, department chairs and deans from the College of Sciences and Francis School of engineering, student internship providers, and students who are near completion. The UTeach Partners’ Dinner, although a social event, is organized such that we invite our partners, students, and program instructors to speak about their experiences with UTeach UMass Lowell. The evening began with an opening welcome by Dr. Anita Greenwood, one of the co-PIs of UTeach UMass Lowell.

Dr. Michelle Scribner-MacLean, the instructor on the PBI course, two of her students (Stephanie Bellerose and Anna Baturin), and one of the PBI mentor teachers, Patrick Kaplo, spoke of their experience with designing and implementing projects.

UTeach UMass Lowell has enjoyed a very strong relationship with Lowell Public Schools since the program first began in January 2012. Although we had worked with teachers in many of the Lowell schools, including the high school, we had only really sent UTeach STARS to Elementary and Middle schools. As UTeach UMass Lowell is preparing high school math and science teachers, we reached out to Lowell HS so that our UTeach interns were more involved in a high school setting. Amy McLeod, Assistant Principal at Lowell High School, spoke on behalf of the staff and students and described the benefits of working with UTeach interns.

The highlight of the evening was having our UTeach graduates come back and tell us about their experience. Eduardo Beato, UTeach UMass alumnus and now a math teacher at Chelmsford HS, talked about his experience with UTeach UMass Lowell, his trials and tribulations and how he utilizes his learning in his profession as a math teacher.

Finally, the evening would not have been as successful as it was had it not been for the efforts of our UTeach project manager, Robin Hall, and the UTeach Ambassadors. Not only were the Ambassadors involved in assisting in organizing the evening, they were also the hosts and speakers. David Entwistle played the crucial role as the MC. Jasmin Moran and Clint Perry presented the work of the UTeach ambassadors, and Alicia Negron rounded off the evening.

We hope that as we move forward, we will be able to continue celebrating and appreciating our partners, instructors, and our students as they are the people who make UTeach UMass Lowell.
UTeach UMass Lowell Instructors—Preparing a New Generation of Teachers

In Addition to the Instructors we also have two dedicated Teaching Assistants:

- Edward Tonelli—assisting in STEP 2, Classroom Interactions & Equity, and Research Methods
- Melinda Willis—assisting in STEP 1 and PBI

Both our Teaching Assistants also supervise Practicum students.

Pasteur Hall Room 106
One University Ave, Lowell, MA 01854

uteach@uml.edu
978-934-3437
www.uml.edu/uteach