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"As the flagship campus of America’s education state, the University of Massachusetts Amherst makes a profound, transformative contribution to the common good, in Massachusetts and beyond. Our enduring vision is to create public impact through innovation. Through the effective use of technology, this vision guides us and remains fresh as we open another chapter in the University’s development."

UMass Amherst Strategic Plan (2013)
I am a seismologist.

I use high performance computing to create three-dimensional models of the layers of the earth and simulate wave propagation that occurs during earthquakes.

My research is computing intensive: without the Massachusetts Green High Performance Computing Center, I would not be able to complete my research.

Haiying Gao, Assistant Professor, Department of Geosciences, College of Natural Sciences
The University of Massachusetts system joined forces with Boston University, Harvard University, MIT, and Northeastern University to launch a major high performance computing environment that advances research in science, engineering, and other areas of academic scholarship.

**GREEN TECHNOLOGY & GROUND-BREAKING RESEARCH**

Located in Holyoke, Mass., and featuring sustainable green technology and facility design, the Massachusetts Green High Performance Computing Center (MGHPCC) constitutes one of the most successful and visible collaborations among state government, industry, and public and private universities in the history of the Commonwealth of Massachusetts.

High performance computers enable groundbreaking research in engineering, science, and medical fields by dramatically improving the speed of results.

Professor Peter Monson’s research group in the chemical engineering department at UMass Amherst uses high performance computing to study
Our research is instrumental to the production of biofuel and gasoline, and has applications in the fields of biotechnology and microelectronics. We are one of the first groups in the world to pursue this line of research using high performance computing.

Peter Monson, Distinguished Professor, Department of Chemical Engineering, College of Engineering

porous and nanoporous materials. Computers generate powerful visualizations that help researchers understand synthesis and other processes specific to these materials. The results have applications in biotechnology and microelectronics, among other fields. Monson’s group often collaborates with Professor Scott Auerbach and other faculty and graduate students in the Department of Chemistry in the College of Natural Sciences at UMass Amherst on these projects.

RESEARCH COLLABORATIONS & COMMUNITY IMPACT

MGHPCC positions Massachusetts as a leader in the innovation economy by enabling collaborations among five of the most research-intensive universities in the Northeast as well as partnerships with local K-12 schools and community colleges.

Since its inception in 2012, MGHPCC has worked closely with the Holyoke Innovation District Task Force to leverage the benefits of the facility’s location in Holyoke, and has partnered with K-12 public schools and community colleges on new educational and workforce development initiatives.

mghpcc.org | mghpcc.umass.edu
Launched in fall 2014, the Integrative Learning Center is one of the most technology-advanced buildings at UMass Amherst. The center responds to the learning needs of a new generation of students with greater access and familiarity with digital technologies.

The center can accommodate over 2,000 students in flexible classrooms equipped with advanced instructional technology (e.g., lecture capture and video conferencing units, microphones, and audio/video devices). The technology and classroom design enable a more personalized, active learning experience: students and faculty can engage in smaller groups, while students can take more responsibility for their own learning and further push disciplinary boundaries.

The building is also home to faculty offices, specialized rooms for TV production, editing rooms, film screening rooms, speech perception, and auditory labs. The center is expected to transform the undergraduate learning experience as well as respond to the student enrollment increase the university is planning for the next decade.
Integrative Learning Center: One of the Most Technology-Advanced Buildings at UMass Amherst

Four-story, 150,000-square-foot building
Approximately 2,000 seats of classroom space
3,600-student-per-hour turnover during the class day
Home to the Departments of Communication, Journalism, Film Studies, and Linguistics
Accessible by foot in 10 minutes or less from anywhere in the campus core
Next to the Lincoln Campus Center and Student Union
Integrative Learning Center: Technology Supports Active Learning

Five team-based learning classrooms use technology to enable more interactive learning: fewer lectures, focus on task-based instruction and problem solving in teams.

One multi-purpose room for media viewing.

Three case study rooms and one tiered-lecture room allow for closer instructor-student interaction and student-to-student collaboration.

Five flex classrooms with flexible seating arrangements.

Informal learning spaces throughout the building.

And much more….

Students use their mobile devices more and look to institutions and instructors for opportunities and encouragement to do so.

Device ownership among U.S. undergraduate students in 2013:

- 89% own laptops
- 76% own smartphones
- 31% own tablets
- 43% own desktop computers
- 16% own e-readers

In 2013, 58 percent of undergraduate students in the U.S. owned three or more Internet-capable devices.

ECAR Study of Undergraduate Students and Information Technology, 2013
Spotlight: Technology Supporting Active Learning in Team-Based Learning Classrooms

With multiple team-based learning classrooms on campus, UMass Amherst is one of the few institutions of higher education in the U.S. to implement team-based learning on a wide scale. Classrooms foster active learning and are designed for team collaboration and problem solving. The layout encourages student-centered approaches to teaching, facilitating student-instructor interaction. The Integrative Learning Center features five team-based learning classrooms.

Central instruction station allows instructors to broadcast classroom displays, better circulate and interact with students.

Student round tables connect laptops and smart technology.

Flat screen displays and whiteboards are available on wall spaces.

High-definition cameras are mounted on room ceilings.
Since 2011, UMass Amherst undergraduate students have used cloud technology to collaborate with peers from several universities abroad as part of a biology course focusing on virtual teamwork in complex bio-technology or bio-medical organizations around the globe. The ‘Cloud Course,’ as it is informally known, stands out for its innovative use of technology that enables students to gain international experience and prepares them for a global economy.

INTERNATIONAL EXPOSURE & COLLABORATIVE DECISION-MAKING
Students work together in virtual teams to review class materials and complete assignments. Teams consist of students from each university (U.S., Ireland, Egypt, Russia, and Taiwan in 2014). Learning outcomes include developing effective decision-making skills and an understanding of cross-cultural differences at play in international teams. “In order to succeed, students must understand […] the cultural and communication differences [among] team members,” says Gino Sorcinelli, the faculty member teaching the class at UMass Amherst. “Working in a virtual team environment is a learned skill and is important for students to grasp before going into the real world.”

PREPARING STUDENTS FOR THE GLOBAL JOB MARKET
The cross-cultural issues students negotiate in this class provide them with a competitive edge upon graduation, preparing them for today’s global job market. Using advanced cloud technology and assignments that focus on workplace decision making, the ‘Cloud Course’ is a close simulation of a real work atmosphere. Similar to international project teams, UMass Amherst students meet face-to-face twice a week, but communicate with team members and complete project requirements exclusively online.

“I’m gaining international experience, which you only get if you study abroad. Even going abroad wouldn’t give the same level of quality that this class offers.”
Lindsay Parenteau, Biochemistry and Molecular Biology Major, Class of 2014
In 2014, the College of Nursing at UMass Amherst started incorporating tablets for teaching and learning. Tablets, such as iPads:

**Provide an affordable alternative to high-cost textbooks**, enabling students to access websites, electronic books, and other course content at a fraction of the textbook price.

**Transform classrooms into dynamic, active learning spaces**. Using tablets during class, instructors can better engage with students by moving to different parts of the classroom more easily.

**Prepare future nurses for a field where mobile devices are increasingly prevalent**. By exposing students to technology, UMass Amherst nursing graduates enter the workforce with a greater competitive edge.

**Enable telemedicine and other distance learning options**. Tablets and other technologies are being used to connect nursing students on the Amherst campus, UMass Center at Springfield, and other locations. In fall 2014, the same nursing class was held simultaneously in Amherst and Springfield, allowing students more flexibility and, where applicable, reducing commuting time.

As part of a collaboration with Apple, nursing faculty are receiving iPads, training on ‘mobile teaching,’ and getting guidance on developing course content for mobile devices. Starting in 2015, all incoming first-year nursing students are receiving iPads.

Nursing teaching facilities at UMass Amherst include a clinical simulation lab with five state-of-the-art clinical simulation rooms, a 16-hospital bed/exam lab area, two clinical exam rooms, and related simulation equipment including models and manikins. The UMass Center in Springfield features a Telehealth Training Center and a Home Health Simulation Center. [www.umass.edu/nursing](http://www.umass.edu/nursing)

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**Vision for the Future:**
Mobile Teaching and Learning in the College of Nursing in Amherst, Springfield, and Beyond

“The five telehealth training rooms in Springfield enable students to observe patient examinations remotely, from any location in the U.S. or abroad. Telemedicine allows nurse practitioners and specialists to interact with patients regardless of distance.”

Linda Lewandowski, Associate Dean for Academic Affairs and Nursing Professor, College of Nursing
One distinct aspect of UMass Amherst is the highly immersive residential educational experience that combines social and developmental opportunities for students. Public research universities are destinations, not just educational delivery systems.

We are aware that many of our students’ families make financial sacrifices to secure the best experience, and UMass Amherst is a clear choice for high school graduates, transfer and graduate students by being a responsive, modern, and scholarly institution.

UMass Amherst offers a complete educational experience, from active and applied learning, to curricular innovation and career development and preparation.

Adapted from the UMass Amherst Strategic Plan (2013)
Since spring 2013, over 5,000 UMass Amherst undergraduate students enrolled in chemistry courses took examinations electronically, using Online Web-based Learning (OWL), a secure electronic learning system. Electronic exams offer more flexibility to students and instructors, including the opportunity to use interactive testing materials and review test scores instantaneously. Instructors recognize the positive impact on teaching and learning, while students report an improved testing experience.

**IMPROVED TEACHING & LEARNING**

Because exams scores are available shortly after the last student completes the exam, instructors can address problematic areas immediately, often in the next class session. “We have the ability to [...] revisit materials right away, the following morning,” says Thomas Whelan, senior lecturer in the Department of Chemistry. This makes for more effective teaching, which facilitates students' learning and ultimately, their academic success, agree faculty members Beatrice Botch, Lara Al-Hariri, and Hans Mentzen, whose chemistry students have been taking electronic exams.
MORE VERSATILE ASSESSMENTS & FEWER INTERRUPTIONS

In a field where understanding chemical structures is vital, instructors have more flexibility with electronic exams, including the ability to include interactive testing materials (e.g., drawing structures) or embed color-coded graphs and other multimedia, otherwise impossible to reproduce on paper multiple-choice exams.

Students report a more relaxed testing experience, with ample seating and fewer interruptions. In a traditional lecture hall setting, students sit shoulder-to-shoulder and are often interrupted when classmates finish at different times.

“My advice to instructors who want to use electronic exams? Do it! Everyone I know who has tried it has sworn never to use a paper exam again.”

Hans Mentzen, Lecturer, Department of Chemistry, College of Natural Sciences

Students Go Mobile

Go.UMass is a device-responsive website that combines students’ personalized academic information (e.g., class schedule, Moodle course components) with other useful campus information, such as dining menus, campus maps, library hours, news, events, and athletics scores.

go.umass.edu
In spring 2014, Public Anthropology students created short films showcasing UMass Amherst faculty’s community-engaged research. Students made use of the university’s multimedia resources, including workshops offered through the Digital Media Lab in the W.E.B. Du Bois Library. For many students, this was their first experience with multimedia production.

BRINGING COMMUNITY-BASED RESEARCH BACK INTO THE COMMUNITY

The Public Anthropology course is a component of Sonya Atalay’s Engaged Anthropology Lab, which aims to increase the impact of anthropological research by making it available to those outside the university. Engaged anthropology often consists of community-based research where academics and community members collaborate in the research process.

Learning in this course was active, applied, and intentional. Students were invested in their video projects and gained valuable video production skills developing their final assignments.

blogs.umass.edu/satalay

“In I’m impressed by the engaged scholarship in the anthropology department and in the campus at large. This project was a way to share that with my students.”

Sonya Atalay, Associate Professor, Department of Anthropology, College of Social and Behavioral Sciences
Helping Student Athletes Excel On and Off the Field

Being a student-athlete brings many rewards and challenges. At UMass Amherst, maintaining academic eligibility is just as important as bringing home the big win. Athletic Academic Support Services is in its fourth year of utilizing GradesFirst, a web-based student performance monitoring system, to easily track students’ grades and academic progress. This streamlines the student-athletic experience and gives students every opportunity to succeed.

GradesFirst allows counselors and coaches to run all-inclusive student reports and enables students to access their detailed personalized calendar or request tutoring appointments.

“When students have a tutoring appointment, the program sends them an automated email reminder at 7 a.m. that morning and then a text [message] an hour before […] we’re seeing fewer missed appointments.”

Matthew Komer, Associate Director, Academic Support Services, UMass Amherst Athletics

www.umass.edu/sas
New in 2014, UMass Amherst student-athletes and athletic trainers benefit from an advanced aquatic therapy pool. Located in the new Football Performance Center, the pool allows for post-surgical workouts and fine-tuned training. The use of an underwater treadmill and camera allows for close analysis of body movement and progress. Water exercise supports body weight while reducing impact to ensure a safe and efficient recovery.

Use of the aquatic therapy pool is available to injured and non-injured athletes for general training and conditioning.

“There are jets that allow us to add resistance [...] the machine has pre-programmed workout sessions and includes a section for notes to track an athlete’s progress.”

Jennifer Brodeur, Associate Head Athletic Trainer, UMass Amherst Athletics
Engaging Students and Promoting Active Learning Through Technology

By integrating new pedagogies with the latest technology into their classes, UMass Amherst instructors often set the standard for curricular innovation.

**Lecture capture**, available in over 50 classrooms across campus and at the UMass Center at Springfield, enables instructors to record lectures and other activities during class or create content outside class time. Students can review the recorded content at their own pace, while instructors dedicate class time to activities other than lectures.

In a ‘flipped classroom’, videos and recorded lectures are available prior to class, allowing students to prepare and better engage with the material during class. Instructors focus on concept engagement through exercises, group work, and question and answer sessions.

“The [flipped classroom approach] radically changes student attitudes [...] students say it allows for a closer relationship with the instructor. This makes for a more comfortable and engaged learning environment.”

Heath Hatch, Senior Lecturer, Department of Physics, College of Natural Sciences

In 2013, nearly three out of four students reported being interested in more lecture capture activities.

*ECAR Study of Undergraduate Students and Information Technology (2013)*
In summer 2013, over 1,300 students participated in UMass Amherst’s first official MOOC, taught by Brian McDermott, co-director of the university’s Online Journalism Program. Sixty-three percent of students enrolled in the web design MOOC were unaffiliated with UMass Amherst, representing Massachusetts, the United States, and 48 countries.

Despite a 10 percent industry average for course completion in MOOCs, 25 percent of students completed the course work in the UMass Amherst MOOC. A key innovation was the cost-effective use of the campus-based Online Web-based Learning system (OWL) to provide students with instant assignment feedback.

With students ranging in age from their 20s into their 80s, and connecting from as far as India or Greece, the web design MOOC showcased the benefits of making learning accessible to a diverse student population across national boundaries.

UMass Amherst Information Technology provided hosting, design, and production support for the course.
Over 3,000 first-year students used ‘clickers,’ personal response hand-held devices resembling remote controls, during the 2014 Summer New Students Orientation. Audience response systems (clickers) are a popular technology at UMass Amherst: in the 2013-2014 academic year, clickers were used in over 140 courses with a total of 24,500 seats. Many faculty tailor course materials based on student clicker responses. Students often report more engagement and an enhanced learning experience in courses where technology tools such as clickers are used.

it.umass.edu/audience-response-system

Clickers are completely integrated into my classroom.
I use them to stimulate discussion and gauge comprehension [...] it boosts students’ confidence and lets me engage the students who typically don’t raise their hands. I teach large lecture courses with 250 to 300 students [...] the technology allows us to have thoughtful, in-depth discussions.

Ray La Raja, Associate Professor, Department of Political Science, College of Social and Behavioral Sciences
Go.UMass is a device-responsive Web site that combines students’ personalized academic information (e.g., class schedule, Moodle course components) with other useful campus information, such as dining menus, campus maps, library hours, news, events, and athletics scores.

Welcoming First-Year Students Games, Fun, and Prizes!

Each year, many first-year students join library and information technology staff for ‘Get Your Game On,’ a gaming event during move-in weekend. Held in the W.E.B. Du Bois Library, the event provides a welcoming and supportive environment where students can play games, make new friends, win prizes, and get to know campus library and technology resources.
In fall 2013, many UMass Amherst undergraduate students entered the university’s Cyber Security Awareness Video and Poster Contest. Contest winner Richard Cuoco shared five social media best practices in his video ‘Security Risks on Social Networking Web Sites.’ Runner-up James Desjardin offered warning signs of online privacy risks in his poster ‘Don’t Talk to Strangers.’

“With an undergraduate student population of over 22,000, UMass Amherst has an opportunity to head off cyber security risks in its largest constituency through peer awareness efforts. Student-developed outreach materials, such as Cuoco’s video or Desjardin’s poster, depict issues of interest to other students in ways that resonate with them, helping change less secure behaviors. it.umass.edu/security/contest

UMass Amherst Students Learn How to Reduce Online Security Risks from Their Peers

In fall 2013, many UMass Amherst undergraduate students entered the university’s Cyber Security Awareness Video and Poster Contest. Contest winner Richard Cuoco shared five social media best practices in his video ‘Security Risks on Social Networking Web Sites.’ Runner-up James Desjardin offered warning signs of online privacy risks in his poster ‘Don’t Talk to Strangers.’

“My poster focused on fraudulent websites. I wanted to provide a few easy steps for spotting phishing and other scams on websites that appear legitimate.”

James Desjardin, Computer Science Major, Class of 2016

“I chose to focus on Facebook because students are often unaware that Facebook photos and posts may prevent you from getting that job or internship you really want.”

Richard Cuoco, Music Major, Class of 2017
In August and October 2014, Apple representatives held workshops at UMass Amherst detailing the accessibility features built into popular technology products. UMass Amherst is dedicated to increasing access to quality education and making university resources available to all members of the university community is an important part of that mission.

UMass Amherst senior Josh Pearson shared his personal journey of seeking accessibility solutions as a blind student. He explained that in his time at UMass Amherst assistive technologies have changed quickly and allowed him to be more mobile on campus. As a first-year student, he carried multiple devices and many backup batteries to make it through his classes, his student job at Disability Services, and his radio show at WMUA, the campus radio station. Now equipped with a laptop, smartphone, and a few accessories, he is able to access his work more easily regardless of location.

it.umass.edu/assistive-technologies

“You don’t have to have sight to have a vision.”

Josh Pearson, Communication Major, Class of 2015

Accessibility Features Built Into Computers and Mobile Devices Support Teaching, Learning, and Research

Cost Savings
Accessibility features are built into many computers and mobile devices, often making the purchase of specialized software applications unnecessary.

Increasing Access Through Collaboration
Over 150 students, faculty, and staff from UMass Amherst, other UMass campuses, and the Five Colleges learned how to incorporate accessibility features into their teaching, learning, and research and to support the diverse needs of their students and colleagues through several interactive workshops in 2014.
UMass Amherst TechTalks is a series of events for students, faculty, and staff, exploring a wide range of technology topics, from creative uses of technology, innovation, and sustainability, to the new ways technology is shaping our future. Events in 2014 have included talks from alumni, software engineers, and representatives from UMass Amherst partner vendors.

The first TechTalks event, ‘Breaking Traditional Stereotypes: The Importance of the Arts in Technology & Sciences,’ featured alumnus Kyle Frazier (B.F.A., Sculpture, 1996), who shared his experience studying at UMass Amherst as a student of fine arts and his transition into the technology field. Frazier explained that his experience at UMass Amherst and in the Five-College system informed his work on a daily basis and credited the interdisciplinary nature of his education as excellent preparation for his career.

“When I was a kid, I was interested in learning computers. I taught myself BASIC code at a time when a lot of people were afraid of using it.

The same concept applies to sculpture: you look at a stone, see what is trapped inside, and let it out.”

In October 2013 and 2014, as part of a system-wide effort to grow information security awareness, privacy and identity theft expert John Sileo spoke to faculty, staff, and students at all UMass campuses about just how easy it can be to fall victim to an online scam. While compromised accounts and credentials are a reality on every college campus, training individuals to secure information is a crucial step toward safeguarding university resources.

Sileo encouraged faculty and staff to question any situation that raised their suspicions and to take a step back from any situation where someone pressured them for information under a tight deadline.

TechTalks in 2014 included:

**Breaking Traditional Stereotypes: The Importance of the Arts in Technology & Sciences** - A UMass alumnus’s perspective on the impact of interdisciplinary training in his information technology career.

**Accessible Technology at UMass Amherst** - Workshops highlighting accessibility features built into popular technology products.

**Approaches to IT Security & Today’s Most Prevalent Attacks** - Perspectives on information security field from UMass alumni who are information security experts.

Frazier is a strategic account executive at an audio visual technology integration company. His work requires him to think creatively about solutions to clients’ problems and an existing technology may not always be available to solve certain problems. “In today’s workplace, collaboration is really key. You need to work across disciplines and have a vision of what you want a project to become,” says Frazier.

**UMass System Collaborates to Bring Identity Theft Speaker to UMass Campuses**

In October 2013 and 2014, as part of a system-wide effort to grow information security awareness, privacy and identity theft expert John Sileo spoke to faculty, staff, and students at all UMass campuses about just how easy it can be to fall victim to an online scam. While compromised accounts and credentials are a reality on every college campus, training individuals to secure information is a crucial step toward safeguarding university resources.

Sileo encouraged faculty and staff to question any situation that raised their suspicions and to take a step back from any situation where someone pressured them for information under a tight deadline.

“I became more aware of the ease of fraud at so many levels.”

Marie W., UMass Amherst staff member on John Sileo’s talk about identity theft.
INVESTING IN LOCAL AREA HIGH SCHOOL TALENT

In summer 2014, UMass Amherst began a collaboration with Tech Foundry, a Springfield-based nonprofit that provides high school students, college graduates, and veterans with in-demand technical and professional skills. The program was developed in collaboration with technology companies, based on local employers’ needs. Interns spent the summer of 2014 and the following months at local companies and institutions, including UMass Amherst, learning more about data analysis, networking and security, technical support, critical thinking, or public speaking.

WESTERN MASSACHUSETTS, THE NEW ‘TECHNOLOGY HUB’

These programs will help build a more robust IT workforce, which, in turn, can help Western Massachusetts become the next ‘technology hub.’ Local organizations will have adequate technical support and more businesses will be willing to capitalize on skilled labor and migrate to the region, revitalizing its economy.

Through its collaboration with Tech Foundry, UMass Amherst can help shape the region’s future. At a strategic level, the internship program provides new, flexible educational opportunities outside the traditional four-year paradigm. At an individual level, these internships can open new horizons for high schoolers who may never consider attending college otherwise.

thetechfoundry.org

“I’ve learned a lot: being in a real job environment, learning from professionals, getting hands-on experience. [...] Now I know what I can do with my [computer science] major.”

Kyle E., Amherst Regional High School, Tech Foundry intern, summer 2014

Photo courtesy of The Republican.
Introducing Young Girls to Science, Technology, Engineering, and Mathematics Promotes Confidence and Academic Success

The Eureka! program brings rising eighth-grade girls onto the UMass Amherst campus to experience science, technology, engineering, and mathematics (STEM) as well as learn about personal development, health, and wellness. The Girls Inc. program is recognized by the Clinton Global Initiative as a successful way to encourage girls to choose STEM college majors or careers. A partnership between the College of Natural Sciences at UMass Amherst and Girls Inc. of Holyoke, Mass., the Eureka! program entered its third year in 2014.

Eureka! encourages imaginative engagement with science through academic risk-taking and learning from mistakes. Hillary Pollan, middle and high school programs site coordinator for Girls Inc., said the program showed girls that they could solve problems in many ways no matter how unusual their ideas were.

Steve Goodwin, Dean of the College of Natural Sciences, notes that Eureka! inspires young girls and UMass Amherst faculty and graduate students alike. “More than 60 [faculty and graduate students] have volunteered to create special projects for this program. We all see a real need to reach out to girls and to show them that science can be fun, and that they can be scientists.” (Girls Inc. of Holyoke and UMass Amherst Launch Eureka!, 2013).

girlsincholyoke.org

Lexani R., Charter Holyoke, age 12 said, “I learned that engineers create new things to solve problems. It was exciting to see everything they do!”
Narrowing the gender gap in science, technology, engineering, and mathematics (STEM) fields is a perennial challenge for educators and industry professionals. Faculty and staff from UMass Amherst School of Computer Science contend that introducing youth to various technologies at an early age and providing professional development to K-12 educators can help.

Since 2007, more than 21,000 K-12 and college students across Massachusetts have attended over 350 events, such as technology career days and fairs, computer camps, and programming and robotics workshops. More than 1,200 faculty, admissions, and guidance staff have participated in professional development. These activities are carried out by the Commonwealth Alliance for Information Technology Education (CAITE) and the Expanding Computing Education Pathways (ECEP) Alliance, National Science Foundation-sponsored efforts based at the UMass Amherst School of Computer Science.

Not coincidentally, the total enrollment of undergraduate computer science majors at UMass Amherst increased by 137 percent (from 244 to 579 students) between 2007 and 2013. Of these, more are women (a growth rate of over 300 percent) and underrepresented groups (a growth rate of over 100 percent).
Investing in Our Future: K-12 Engagement

“After attending events with my students, I’ve noticed girls become student mentors and help other kids with technology [...] they also feel empowered to use new types of technology.”

Kathryn Runyan, K-6 Instructional Technology Teacher, Wildwood Elementary, Amherst, Mass.

ROBOTICS AND CODING EVENTS MAKE TECHNOLOGY ACCESSIBLE TO K-12 GIRLS

Girls Connect, a one-day introduction to robotics for girls ages 8 to 13 in Western Massachusetts, organized by CAITE, in partnership with FIRST LEGO League, has been particularly successful. Renee Fall, CAITE project manager and ECEP co-principal investigator, says, “The ‘robot’ event is an eye opener for parents and teachers when they see the high level of interest and what the girls can accomplish in a day. It opens possibilities for girls […] and more importantly, starts a longer experience with computing.”

Computer Science Education Week, a nationwide event held each December engages local K-12 schools, youth-serving organizations, and communities to expose students to computing opportunities. In 2013, girls from Girls Inc. of Holyoke tried their hand at programming based on the popular game, Angry Birds.

By introducing students from the local communities to computing and information technology, and partnering with K-12 teachers to help students become creators of technology, these projects help address critical issues of underrepresentation in technology fields, shape a new generation of students, and advance the Massachusetts innovation community.

catie.cs.umass.edu | expandingcomputing.cs.umass.edu
UMass Amherst: Investment of Choice for the Commonwealth’s Progress

UMass Amherst is an innovative, responsive, and rewarding partner for investment with clear areas of national and international research strength, and the capacity to work collaboratively in creating knowledge and putting ideas to work.

As a land grant institution, we have a 150-year history of integrating the application of our research and learning with the needs of state and local agencies, organizations, citizens, and other community partners to create impact through engagement.

Technology at UMass Amherst empowers research innovation, community engagement, and student, faculty, and staff success. It is through these efforts that we advance the frontiers of knowledge and disseminate those insights throughout society.

Adapted from the UMass Amherst Strategic Plan (2013)
Verizon Gift Enables Football Fans To Connect at McGuirk Stadium

In the middle of the big game, UMass Amherst football supporters expect to send updates to friends via text messaging or post photos and videos to social media. To provide the necessary cellular coverage to students, alumni, and neighbors during these high-traffic times, Verizon Wireless provided a cell-on-wheels mobile cell site, valued at over $10,000, during three football games at McGuirk Alumni Stadium in 2014.

Juniper Networks, an industry leader in network innovation, donated networking equipment with a list price of $1.5 million to the university in 2014. UMass Amherst will use the technology donation, made through Juniper’s Academic Alliance program, to build a dedicated high-speed network to support science research and increase the ease of use and speed of large academic data transfers across campus and with the Massachusetts Green High Performance Computing Center in Holyoke, Mass. The donation supports faculty and student discoveries while enhancing the value of our existing infrastructure.

UMass Amherst Chancellor Kumble R. Subbaswamy said, “This generous donation from an innovation leader recognizes the long-term value of supporting research at the commonwealth’s flagship university. Such collaborations have the power to benefit our students, the computing industry, and the entire economy of Massachusetts and beyond.”

“Juniper Networks Donates $1.5 Million in Equipment for Advanced High-Speed Network”

“We are excited to provide this innovative, high performance equipment to UMass Amherst to enable the workforce of the future using ‘High IQ’ networks for world-class collaboration, research, and information sharing.”

John F. Orbe, Americas Enterprise, Juniper Networks
eduroam Provides Global Wireless Connectivity to UMass Students, Faculty and Staff

In summer 2014, eduroam (education roaming), a worldwide roaming service, became the encrypted wireless network at UMass Amherst, providing automatic wireless connectivity on campus and at over 12,000 participating institutions worldwide. By November 2014, 87 percent of UMass Amherst students, faculty, and staff had switched to eduroam for wireless access on campus.

In 2013, UMass Amherst was one of the 24 percent of higher education institutions in the U.S. to offer eduroam (EDUCAUSE Review, 2013). By providing an alternative to registering for a wireless guest pass or connecting to a slower, less secure guest network, eduroam makes traveling to other institutions easier for:

UMass system students, faculty, and staff
UMass Amherst students studying abroad or taking Five-College courses
Five-College students taking courses at UMass Amherst
Faculty and staff attending conferences at other institutions in the U.S. and abroad
Scholars conducting research at partner libraries or archives
International and domestic exchange students, graduate students, or visiting faculty from other institutions coming to UMass Amherst

eduroam.org | it.umass.edu/about-eduroam

What is eduroam?
eduroam is a worldwide network access service that enables UMass Amherst students, faculty, and staff to connect to encrypted wireless networks at thousands of institutions in the U.S. and abroad. Once set up, computing devices automatically connect to eduroam on campus and at participating institutions.
eduroam for Work & Research: A Case Study

UMass Amherst mathematics instructor Brian Burrell was an early adopter of eduroam after discovering he could connect to local colleges’ wireless networks more easily. He could prepare his courses, which required access to online course sites, and perform statistical and book research in a location more convenient to his home.

Burrell was also able to conduct research for his new book on neurological defects and disorders, co-authored with neurologist Allan Ropper. Burrell needed to be constantly connected while working on this project, “I travel a lot, and I need to have access to email and Skype, so it’s useful to know I can travel and get wi-fi where ever I am.”

eduroam is available at over 180 institutions in the U.S. and in over 12,000 locations worldwide.
The UMass Center at Springfield opened to area students in September 2014. The new center is a collaborative effort among all of the University of Massachusetts campuses, and two area community colleges, Holyoke Community College and Springfield Technical Community College. Courses offered in Springfield are based on the needs of area residents and include healthcare and nursing, business management, cyber security, education, regional planning, and architecture and design, with more to come.

UMass Center at Springfield at a Glance

Opened on September 2, 2014 to 250 students.

26,000 square feet in Tower Square building, downtown Springfield.

Course offerings from UMass Amherst and other UMass campuses.

UMass Amherst courses: Nursing, Business Administration, Landscape Architecture, Education, Architecture, University Without Walls.
Many university leaders, city and government officials, and Western Massachusetts residents recognized Springfield as an ideal location for expanding the university. Opening a satellite location in Springfield contributes to the University of Massachusetts mission of increasing access to affordable education for the residents of the commonwealth.

The UMass Amherst College of Nursing is one of several programs bringing much-needed training to Springfield. There is demand for these courses in Springfield, home to two major hospitals, as nursing staff are often required to keep their skills up-to-date with continuing education credits.

umasscenteratspringfield.org

Innovative Teaching Technology for Nursing

Home Health Simulation Center recreates home visit experience.

Telehealth Training Center connects students with healthcare professionals & patients in other locations.

Eight-bed emergency room simulation lab.

Cost Savings

The 25 mile trip to Amherst to attend classes does not fit into the busy schedule of many Western Massachusetts professionals. By bringing University of Massachusetts courses to Springfield, education becomes more accessible and affordable to a larger group of local residents.
Efficiency & Effectiveness

In an effort to improve learning outcomes and reduce costs, public research universities find themselves in a technology race. Successful competition requires greater efficiency and effectiveness as information technology is increasingly central to teaching, research, and administrative effectiveness.

Adapted from the UMass Amherst Strategic Plan (2013)
In the past decade, UMass Amherst instructors have opted to develop and publish their own course materials using Online Web-based Learning (OWL), an online homework and learning platform. Electronic books using OWL (or OWLBooks) have successfully replaced proprietary, high-cost textbooks in several computer science, chemistry, and biochemistry courses.

Both students and instructors agree: home-grown, digital textbooks provide significant cost savings, especially for STEM (science, technology, engineering and mathematics) courses, more engagement with course materials, and more flexibility for instructors to address students’ learning needs.

**AN AFFORDABLE ALTERNATIVE TO HIGH-COST TEXTBOOKS**

Over 8,000 UMass Amherst undergraduates have used professor Robbie Moll’s iJava OWLBook in the past ten years for a total savings of $420,000. Chemistry students have saved over $110,000 in the


Total savings provided by OWLBooks in the past ten years: over $1 Million.
past seven years by using professor David Gross’s OWLBook. The total savings enabled by OWLBooks in the past decade is over $1 million, complementing the savings generated by the university’s Open Education Initiative, a faculty-incentive program that supports the use of free or low-cost information resources.

**PROMOTING ACTIVE LEARNING, IMPROVING STUDENT PERFORMANCE**

With multimedia and other interactive features, digital textbooks such as OWLBooks have transformed students’ learning experience. In classes that use open educational resources such as OWLBooks, students:

- **Access content with more ease** (can search, highlight, or take notes within texts from their computers, tablets, or other mobile devices)
- **Report more involvement with learning materials**
- **Are more engaged and prepared**
- **Yield better overall performance**

Instructors also have more flexibility to choose and make changes to course content in order to meet their students’ learning needs.

The Open Education Initiative and OWLBooks are representative of the movement for open educational resources, where digital materials are available at no cost through open, non-restrictive licenses. The movement has been accelerated by the proliferation of e-reader devices and the availability of digital materials on the web.

Launched by the Provost’s Office and University Libraries in 2011, the Open Education Initiative at UMass Amherst has brought together over 30 instructors teaching graduate and undergraduate courses in a variety of disciplines and has generated considerable savings for students.

guides.library.umass.edu/oer
Since fall 2013, academic departments have a new and easier way to submit class offerings for publication in the university’s online Schedule of Classes. The new Class Automated Proposal System (CAPS) enables departments to manage their schedule of classes for the upcoming semesters using SPIRE, the university’s web-based student information system. Prior to CAPS, academic departments submitted their class offerings to the Registrar’s Office on paper.

**SIMPLE, EFFICIENT COURSE SCHEDULING**

With CAPS, academic departments have a simple, efficient, and environment-friendly way to communicate with the Registrar’s Office on class scheduling. Designated staff and faculty use CAPS to:

- Add or cancel class sections, class location, instructors, or capacity
- Manage waitlists and enrollment
- Update the instruction mode (e.g., online, in person)
- Add consent requirements (i.e., instructor’s consent needed to add the class)
- Specify room characteristics (e.g., multimedia equipment, team-based learning classroom)
- View a history of changes (e.g., when a section was updated)
- Communicate with the Registrar’s Office directly
- And much more...

**CAPS at a Glance**

The university saves an average of 45,000 pages or 90 reams of paper per year using CAPS.

Since 2013, the Registrar’s Office has processed over 80,000 course scheduling requests.

“I really like CAPS. I wanted something like this for a long time.”

Julie Pahl, Undergraduate Advisor, Department of Psychological & Brain Sciences, College of Natural Sciences
Information and Communication Technology Council

The Information and Communication Technology Council (ICTC) of the Faculty Senate reviews and makes recommendations with respect to campus infrastructure, policies, planning, and priorities related to information and communication technologies at UMass Amherst. Members represent a variety of academic and administrative departments.

2014-2015

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Information Technology (IT) at UMass Amherst, the flagship campus of the commonwealth, supports our core mission of teaching, learning, research, and engagement. At its heart, IT enables communication, which allows our campus to reach out and connect with more prospective students, enhances the experiences of current students and their families, and supports relationship building with alumni and friends of the institution. IT also helps us to efficiently bridge geographic distances and grow relationships with others who have shared interests, including agency and industry collaborators throughout the world.

I want to thank the many people across our campus that came together to share their stories of how they use technology. I am also grateful for the support from our campus leaders on this inaugural edition. Our first IT annual report provides a mere glimpse of UMass Amherst initiatives using technology. We are a campus on the move and will have much more to share in future editions.

I hope you enjoy our IT annual report. If you have a topic for our next issue, please feel free to contact my office directly.

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Information Technology is

Empowering.

Kumble R. Subbaswamy, Chancellor, UMass Amherst