EIU M.S. in Technology
First Choice Application, 2015

Criterion 1: The program documents sustained achievements in strengthening the quality, diversity and internationalization of the University's student body by attracting candidates who have the potential for academic and professional achievement and who complete degrees and succeed as alumni.

1.a Enrollment Management

1.a.i Recruitment Plan: The program provides a clear recruitment plan and evidence that it meets its intended application, enrollment and diversity goals.

The M.S. in Technology program uses several recruitment tools to attract a variety of graduate students, including:

- The School of Technology Web Site: The graduate pages are updated a minimum of semi-annually and other times as needed.
- Printed materials: The graduate program has a variety of printed materials that explain various program options. (See **Appendix 1.a.i.1**)
- Open Houses and Special Recruitment Events: The graduate program participates in several open houses and special recruitment events throughout the year both on-campus and at locations such as Parkland College, ADM facilities in Decatur, and elsewhere. Typically, an information night or open house is preceded by an advertisement in the local newspaper as well as in the local community college publication. The annual Graduate School Day is also attended each year by the graduate coordinator, graduate assistants and faculty.
- Print Advertising: An advertisement about the program is placed each September in the magazine, *Education International.*
- Web Advertising: program information is placed online each January in *Education International.*

The most important recruitment tool is personal contact. All School of Technology faculty members are regularly reminded to encourage promising undergraduate students to consider applying for the M.S. in Technology program.

The program coordinator maintains a contacts file that contains information about each person who has inquired about the M.S. in Technology program. A follow-up letter is sent to these inquiries. Personal interviews and follow-up contacts are also part of a regular system of cultivation and recruitment.

The School of Technology has been partnering with the School of Continuing Education in several ways. First, the School of Continuing Education and the School of Technology have collaborated on initiating a cohort program for the M.S. in Technology in the Chicago area. Second, the School of Continuing Education staff members, located at Parkland College in Champaign, actively promote the M.S. in Technology through contacts with prospective students, visits to employers in the area and participation in promotional fairs in the Champaign-Urbana, Danville, and Decatur areas. The School of Continuing Education staff members, housed at Parkland College, send monthly reports to the Graduate Coordinator on contacts so that the Graduate Coordinator can make follow-up contact by telephone and mail.

EIU M.S. in Technology
First Choice Application, 2015

A copy of the School of Technology graduate program marketing plan is included as **Appendix 1.a.i.2**.

In past years, the program's recruitment goal for each year was approximately 100 students. This allowed SOT to maintain an over-all enrollment of approximately 120 students in the M.S. in Technology program. Increasing demand from the international student population has caused a shift in this mindset, leading to a deliberate expansion of enrollment. The program does not have specific goals for international students, although it advertises in publications read by international students and does admit a growing number of international students each year. See **Table 1** below for historical demographic data of M.S. in Technology students:

Table 1: Historical Enrollment and Demographic Data for Master of Science in Technology

Fall	2007	2008	2009	2010	2011	2012	2013	2014
Total	143	123	125	150	139	137	161	183
On-Campus	106	92	86	104	106	86	111	151
Off-Campus	37	31	39	46	33	51	50	32
Full-Time	87	58	65	65	65	60	93	119
Part-Time	56	65	60	85	74	77	68	64
Male	84	81	80	95	86	96	103	108
Female	59	42	45	55	53	41	58	75
Minority	5	9	13	17	22	20	21	15
International	68	51	40	40	43	43	78	113

1.a.ii Selection Criteria: The program documents a rationale for its admission selection decisions in order to show that it is fulfilling its expectations for candidate quality.

The program examines the following application criteria to make its admission decision:
- Undergraduate GPA
- Two letters of recommendation
- Statement of personal and professional learning goals for the program
- Resume showing working experience relevant to technology

Each applicant's file is circulated to two faculty members who review the file and made a recommendation to deny, admit provisionally, or admit fully an applicant. The coordinator reviews these recommendations and makes the final decision after a face-to-face interview with domestic candidates. The coordinator also notifies all admitted students of their admission status by letter.

1.a.iii Acceptance Rate: The program documents that desired applicants accept admission offers.

Table 2 on page 3 indicates the number of applicants and the number of admissions by year for the past five years, and shows dramatically increasing demand for the program:

Table 2: Historical Applicant and Admission Data for Master of Science in Technology

Year	Applicants	Admissions
2013-2014	385	138
2012-2013	189	126
2011-2012	191	138
2010-2011	141	102
2009-2010	132	103

1.b Assistantship/Scholarship Management

1.b.i Annual Awards: The program documents that its annual allocated assistantships enchance program quality by attracting desired applicants and by showing that the teaching, research, or service experiences add value to the degree.

The M.S. in Technology program has seven graduate assistantships. These graduate assistants are assigned to the seven laboratories operated by the School of Technology. These include:
- The Production/Construction Laboratory
- The Graphics Communication/Printing Laboratory
- The CAD/CIM Laboratory
- The Automation/Robotics/Control Laboratory
- The Network/Telecommunications Laboratory
- The Materials/Polymers Laboratory
- The Scanning Electron Microscope/Servers Laboratory

Each graduate assistant works under the direction of a faculty member, assisting with laboratory instruction and supervising required laboratory experiences that are a part of various Applied Engineering and Technology courses. Graduate assistants attend the courses related to these laboratory assignments. They maintain equipment and they supervise open laboratories. They are available to answer student questions. Graduate assistants in the M.S. in Technology program thus have excellent opportunities for value-added experiences in teaching and research. Several graduate assistants have later returned and become Unit A/B faculty members in the School of Technology. These include: Dr. James McKirahan, Aaron Melton, Sean Roberts, and Gabe Grant.

Periodically, the School of Continuing Education sponsors an additional graduate assistant for the Training and Development area of study to assist with delivery of OPD courses. Kris DeVito, who was a Presidential GA for the OPD program, obtained a position as Director of Training with the Macy's Corporation, partially as a result of her experiences as a graduate assistant.

1.b.ii Competitive Awards: The program documents that it competitively acquires additional assistantships that further enhance quality by attracting additional desired applicants and by showing that the teaching, research, or service experiences add value to the degree.

The M.S. in Technology program has received several presidential assistantships: Gabriel Grant, Kris DeVito, Christopher Che Fridrick, Aaron Melton, and Kim Ervin. These assistantships provided excellent opportunities for service, research and teaching experience. Kim Ervin now works full-time for CATS. Gabe Grant and Aaron Melton are now Unit B faculty members teaching in the Applied Engineering and Technology program.

A former School of Technology faculty member has made a donation to support creation of a one-year renewable graduate assistantship, the Cliff and Kate Strandberg Graduate Assistantship, beginning in Fall, 2014. Additional similar sponsorships are being sought.

As part of the National Science Foundation grant awarded to the School of Technology, one additional graduate assistantship has become available to the M.S. in Technology program. This assistantship works with the NSF grant implementation, and experience offers GAs an outstanding opportunity to grow as a researcher. Jacob Hixon (graduate) and Lucas Phillips (current) have both benefitted from this opportunity.

To support the Center for Clean Energy Research and Education (CENCERE), the M.S. in Technology program has obtained still another graduate assistantship. Wei Wang, who received this assistantship and graduated Summer 2013, worked closely on research projects with Drs. Liu and Cloward and has had opportunities to present at professional conferences on his research, including the 2012 Renewable Energy Symposium organized at Eastern Illinois University and the 2013 American Chemical Society Conference in Indianapolis.

Because two of the content areas within the M.S. in Technology program overlap closely with the mission of the Center for Academic Technology and Support (CATS), M.S. in Technology students are often able to obtain graduate assistantships in CATS. The cross-fertilization between their coursework in the M.S. in Technology program and their work at CATS has provided these students with value-added experiences that enhance their academic program. Antoine Thomas, Kim Erwin, and Pete Grant all received CATS GA positions, graduated from the M.S. in Technology program, and are current professionals in CATS.

1.c Matriculation Management: The program has a targeted graduation rate and documents that degree candidates consistently meet the program's degree completion expectations.

The time-to-degree varies among full-time and part-time students. With the large number of part-time students, it is very difficult to monitor graduation rates. These part-time students may stop-out for several semesters due to work responsibilities or personal crises. The graduate program is in the process of implementing a formal system to track retention numbers using an Access database; according to our experience, the retention rate has been high.

1.d Graduate Placement: The program documents sustained placement achievements of graduates.

Most of our students are employed throughout their graduate program and continue working with the same employers after graduation. Consequently, we have not historically felt a need to track student placement in the same manner as more traditional programs in which students study full-

time and then, subsequent to graduation, either take professional positions or continue with their graduate education. Placement report data as reported by Career Services was reviewed and found unreliable due to an extremely low response rate (<10%) Development of a Linked-In group for graduates, to acquire more complete placement information and increase contact with alumni, is being explored.

Criterion 2: The program documents sustained achievements in fostering advanced scholarship through a depth of knowledge, critical thinking, problem solving, oral and written communication, application of technology, research/creative activity, and commitment to professional ethics.

2.a Assessment Results Documented by the center for Academic Support and Achievement

Review of the program's Assessment Plan by the Center for Academic Support and Achievement (CASA) documents that the M.S. in Technology program uses assessment data in a variety of ways to improve student learning and to achieve academic excellence. Copies of recent assessment plans and plan reviews are available at the CASA web site. In the 2011 response to the M.S. in Technology report, the Center for Academic Support and Achievement said of the program's assessment objectives, "These objectives are programmatic and measurable." In responding to the use of assessment data by the program, it reported that "The feedback loop appears to be in place with all the faculty and department committees involved. Because the M.S. in Technology program has achieved a level 3 review for most areas of the assessment report, it has achieved a two-year report status that reflects the maturity and effectiveness of the graduate program assessment process.

The M.S. in Technology program received the Provost's Assessment Award in AY 2006. In 2011, CASA placed the program on a two-year reporting cycle, citing its maturity in assessment processes. The program was submitted for the Provost's Assessment Award again in 2012. A copy of the 2013 assessment submission and evaluation are included in **Appendix 2.b.1**.

The School of Technology graduate program has developed objectives for graduate students to meet. These major objectives are:
1. Students will develop effective oral and written communication skills
2. Students will be able to conduct intellectual research in technology
3. Students will analyze, apply, and evaluate concepts of effective leadership
4. Students will possess knowledge of strategy, principles, and tools of quality systems as applied to business and industry
5. Students will develop understanding of the global impact of technology
6. Students will be able to apply critical thinking and problem solving skills in areas of technology management, training and development, career and technical education, or computer technology.

The annual assessment report (found on the CASA website) lists methods for assessment for each of these objectives and both the direct and indirect measure associated with them. This

report lists the full results of the annual assessment. The summarized results for each of the above mentioned objectives for the previous four reporting cycles are in **Table 3** below:

Table 3: Results of Direct Assessments for M.S. in Technology Major Objectives

		Objective											
	Expectation	1		2		3		4		5		6	
Year	Level	#	%	#	%	#	%	#	%	#	%	#	%
2008-09	Objective *n*	18		15		20		20		24		18	
	Exceeded	3	17	6	40	12	60	12	60	4	17	3	17
	Met	15	83	7	48	8	40	8	40	19	79	15	83
	Not met	0	0	2	13	0	0	0	0	1	4	0	0
2009-10	Objective *n*	30		16		23		17		20		30	
	Exceeded	4	13	6	37	9	39	5	29	12	60	4	13
	Met	26	87	10	62	14	61	12	71	7	35	26	87
	Not met	0	0	0	0	0	0	0	0	1	5	0	0
2010-11	Objective *n*	33		40		34		35		20		33	
	Exceeded	17	52	3	8	28	83	27	77	20	100	17	52
	Met	15	45	31	78	4	12	8	23	0	0	15	45
	Not met	1	3	6	15	2	5	0	0	0	0	1	3
2012-13	Objective *n*	17		10		22		19		20		17	
	Exceeded	14	82	6	60	17	77	18	95	20	100	3	18
	Met	3	28	3	30	5	23	1	5	0	0	14	82
	Not met	0	0	1	10	0	0	0	0	0	0	0	0

2.b Assessment Results Documented by the Graduate School

The Dean of The Graduate School has also conducted annual program reviews (See **Appendix 2.b.2**). Past reports have noted that the M.S. in Technology plan offers an effective summary of how candidates are meeting the program's expectations for The Graduate School goal of depth of content knowledge. It praises the M.S. in Technology for well-focused and well-written assessment of oral and written communication that provides both direct and indirect evidence that the program's expectations have been met.   The 2012 review by The Graduate School Dean also stated that a particular strength of the M.S. in Technology program is the emphasis on student scholarship. Additionally, the Dean of the Graduate School has recommended the M.S. in Technology assessment report as a model for other programs because of its depth and quality.

Criterion 3: The program documents sustained achievements in expanding the curriculum with rigorous advanced courses and options offered through lectures, laboratories, seminars, forums, practicum field experiences, internships, and partnerships with education, business, and industry.

3.a. Sustained Mission and Planning Leadership. **The program articulates a clear mission that is aligned with current and future trends in the discipline and that states the program's strengths.**

The M.S. in Technology program faculty constantly reviews the objectives and mission of the program. The last revision to the Program Mission Statement was made in 2005, after review by the M.S. in Technology core faculty and School of Technology faculty. The revised mission is now consistent with the current standards in the discipline as well as better reflecting what the Program provides to the graduate students. The M.S. in Technology Mission Statement follows:

"The graduate program in Technology prepares students to become successful leaders in today's technological and global environment. Towards this goal, the program is designed to provide students with opportunities for developing advanced professional, technical and personal competencies in the field of technology. It enables students to identify, develop and implement quality strategies and practices in contemporary organizations. In addition, students enhance their research and communication skills necessary for technological leadership. They also gain an appreciation of ethical and social implications of technology related to a global and technological society."

3.b Sustained Curricular Leadership by Program Administration and Faculty: The program documents that its administrative structure and graduate faculty advance the curriculum.

3.b.i Administrative Leadership. The program documents how its administrative structure and leadership advance the quality of its curriculum.

The administrative structure is composed of the School of Technology Chair, the Graduate Coordinator, Graduate Faculty, and the M.S. in Technology Graduate Committee.

Core Program Faculty: The core faculty consists of the Graduate Coordinator and seventeen School of Technology faculty members. In addition to serving on the Graduate Committee, core faculty members have served on subcommittees or have been given primary responsibility for various tasks such as reviewing graduate applications, revision of the curriculum, and development of syllabi for elective courses.

M.S. in Technology Graduate Committee: The Graduate Committee for the program consists of the Graduate Coordinator and four Core Program Faculty members elected by the graduate faculty. The committee meets one to two times per month during the academic year to discuss program issues (e.g., assessment, curriculum, student-related issues, comprehensive knowledge presentations, and other program-related matters). The four areas of study within the program represented on the graduate committee are:
- Career and Technical Education
- Computer Technology
- Technology Management
- Training and Development

The Graduate Coordinator, in consultation with the School Chair, is responsible for all administrative duties related to the program including chairing graduate committee meetings, coordinating both Thesis Option and Non-Thesis Option (Certification of Comprehensive Knowledge, CCK), overseeing admissions and organizing graduate student orientations, communicating with prospective students, advising currently enrolled students, obtaining assessment data, and updating written materials (e.g., handbook, thesis and non-thesis manuals, GA guidelines, website information).

3.b.ii Graduate faculty leadership: The program documents the significant role of the graduate faculty with advancing the curriculum through curriculum committees or appropriate curriculum processes.

Graduate faculty meet with the program committee regularly to review assessment data related to courses they teach, particularly those who teach core required courses in the program. Graduate faculty members comprise the graduate committee and review all significant changes to course content as well as the development of new courses in the curriculum. Graduate faculty members are also involved in advising thesis writing for thesis option and Certification of Comprehensive Knowledge preparation. Graduate faculty members in four study areas (Technology Management, Training and Development, Career and Technical Education, and Computer Technology) regularly discuss the direction and structure of graduate study in School of Technology and address issues within each area.

The MS in Technology program offers five study areas:
- Career and Technical Education
- Computer Technology
- Resource Management Technology
- Technology Management
- Training and Development

In addition, the program offers five graduate certificates:
- Computer Technology
- Quality Systems
- Technology Security
- Training and Development
- Work Performance Improvement

The development of the Quality Systems, Work Performance Improvement and Computer Technology certificates was in response to a call from Graduate School to develop certificate programs. For these efforts, the MS in Technology program received the Leadership Award in 2003-2004, as these were the first graduate certificate programs developed at Eastern Illinois University.

In 2005 the School of Technology developed the Technology Security certificate program in response to an IBHE request for programs related to technology security. Four key courses were developed for this certificate:
- Biometrics Security

- Database Security and Reliability
- Facility Security
- Network Security

As a result of the Technology Security certificate, Eastern received the Caterpillar Homeland Security Fund, which grants scholarships annually to students pursuing studies in technology security.

Other new courses include those in the Training and Development area of study. They were in response to CASA's assessment process. Courses include:
- Assessment of Needs in Training and Development
- Instructional Systems Design
- Strategic Employee Development

Additional courses that have been developed based on the CASA assessments include:
- Advanced Web Technology
- Java Applications for Technology

A new graduate course has also been developed to support the emphasis on renewable energy: Biomass Gasification.

We have also used special topics courses to foster innovation and meet special needs, particularly in the computer technology area, such as PHP/Oracle Development and Advanced Web Technologies. A new special topic course, Critical Issues in Energy, has been developed as a campus-wide interdisciplinary effort on sustainable energy.

3.c. Sustained Curricular Leadership by External Review

The M.S. in Technology program was reviewed by the Illinois Board of Higher Education (IBHE) in 2012. The Graduate Programs in Technology serve the largest number of students in the State of Illinois among peer institutions. For instance, the most recent IBHE data indicated the EIU M.S. in Technology enrolled 150 students during Fall 2010, while similar programs offered by Illinois Institute of Technology enrolled 56 and Illinois State University 67 students for the same period. The major strength of our M.S. in Technology program is the diverse student body including gender, nationality and undergraduate disciplines. The programs remain vibrant and attractive to students thanks to the program design that allows students to customize their graduate studies based upon the individual's career goals and interests. The programs are committed to being accessible to a diverse body of students in the state and around the globe.

The School of Technology Advisory Board discusses all programs in SOT and overall school direction. The Graduate Coordinator, Dr. Peter Ping Liu, regularly attends the semi-annual Board meetings to update the Board on the graduate program's status and acquires and incorporates feedback as appropriate. Post-baccalaureate certificate discussion is one example where Board input was requested, as well as any significant programmatic graduation requirement changes.

3.d Sustained Capstone Leadership: The program requires a rigorous capstone appropriate to the mission of its degree and certificate options and documents the impact of each of its capstones on the quality of learning in the degree program.

The MS in Technology has three capstone experiences: internship, Certification of Comprehensive Knowledge (CCK), and master thesis. Our students have served internship at a wide range of local and national organizations. A list of nearly 30 organizations is presented in the section of "Sustained External Partnerships".

Candidates for the non-thesis option are required to successfully obtain a Certification of Comprehensive Knowledge (CCK) during Spring or Fall semester when they expect to graduate with the degree. The certification requires the student to conduct a one-hour independent study under the direct supervision of a graduate faculty; this is done in order to complete a written report and an oral presentation. Students present a reality-based case (extended example) using a problem solving/decision making format to demonstrate how the knowledge, principles, and tools learned during graduate study may be applied to solve problems or to resolve practical issues. The case should be an actual case based upon candidate's professional experience or personal experience, or literature review. Concepts and principles from at least four elective courses from one area of study should be integrated into the case study.

The thesis option for the MS in Technology degree requires six hours of thesis work in addition to thirty hours of course work. Most students choose to complete an empirical project which includes data collection, analyses of the data, full thesis preparation (following the standard APA style format), and a formal defense. All thesis topics must be approved by the thesis committee prior to the student advancing to work on the research. Hard copies of recent departmental theses are available for review in Booth Library. The thesis project is an excellent learning opportunity for the students in integrating the information obtained from multiple courses in the curriculum. The thesis process also greatly enhances students' understanding of the research process/scientific method, and is necessary for those who have a long term goal of doctoral study. In 2009, School of Technology graduate student Daniel P. Harvey II received the Distinguished Master's Thesis Award (one recipient campus wide) & Midwest Association of Graduate Schools Thesis Nomination for his thesis "Automated Estimation of Time Codes for Captioning Digital Media." Dr. Peter Ping Liu served as his faculty mentor.

3.e. Sustained Student Leadership: The program documents how it fosters the participation of its graduate candidates on the Graduate Student Advisory Council and/or the Black Graduate Student Association to ensure that students advance the quality of graduate study and curriculum, seminars, forums, and related programs.

Students in M.S. in Technology program actively participated in scholarship activities. A long list of publications and presentations at university and national levels is presented in Criteria 4. Students in M.S. in Technology program also demonstrate leadership in various university organizations. In 2011, one of our students, Kim Ensign, was elected as the president of Graduate Student Advisory Council (GSAC). In 2010-2011, our student Naga Kotagiri served as the president of EIU Indian Students Association. Another graduate student, Wei Wang, is currently the president of EIU Chinese Student and Scholar Association (CSSA). Additionally,

the first ever Graduate Student Commencement Speaker (2013), David Closson, was an M.S. in Technology graduate, and Brad Oyer is currently serving as Student Dean of the Graduate School.

3.f. Sustained Alumni Leadership: The program documents how it fosters participation in alumni programs sponsored by the Graduate School Alumni Advisory Board to ensure that alumni advance the quality of graduate study and achievements of alumni.

Fred Apeaning (2007) and Jing Shao (2005) were recognized by the EIU Graduate School as Global Ambassadors in 2014. Additionally, Dr. Wen-Jhy Daniel Wang (2009) and Krupa Praneeth Kandavalli (2012), are past Global Ambassadors recipients. Graduates of the M.S. in Technology currently serve on the School of Technology Advisory Board, including J.R. Elder, Dr. Jonathan Gosse, and Nathan Wall.

Graduates of the MS in Technology program at EIU enjoy a wide range of successful careers. Many graduates work as part of management teams in various organizations. Typical positions held by former graduates include:
- Production Manager
- Manufacturing Engineer
- Quality Assurance Engineer
- Quality Manager/Director
- Industrial Designer
- Plant Manager
- Employment Manager
- Program Development Coordinator
- Training Coordinator/Director
- Training Consultant/Specialist
- Human Resources Manager
- Career and Technology Education Teacher
- School Librarian
- Technology Director/Coordinator

Graduates work effectively in organizations of various sizes, including:
- Boeing
- Caterpillar
- Ingersoll-Rand
- Agri-Fab
- Carle Foundation Hospital
- Amdocs
- University of Illinois
- Eastern Illinois University
- Merck and Company
- Wells Fargo

3.g. Sustained External Partnerships: The program sustains external partnerships appropriate to its mission and documents assets that partners contribute to advance the quality of the curriculum.

The program has longstanding ongoing partnerships with many organizations in Illinois and in the country. In recent years, the graduate students have been obtaining their internship. The following is a list of organizations at which our students have completed internships since 2009:

- GE Mattoon
- CATS at EIU
- State Farm
- R and B Sports and Entertainment
- EIU HR Training and Development
- EIU Communications Study Department
- Ruiz Construction
- Justrite Manufacturing
- Sapot Systems Inc., Katy, TX
- WinInfosys
- Adams Memorial
- Charleston Transitional Facility
- Tempestar of Caelum Production
- PrimaSoft
- CMT, Nashville, TN
- SRICOM, Inc., Bensalem, PA
- Orionteck
- Idol Soft
- WITH LLC
- Code Ace Solutions
- Tribis Inc
- Interactive Business Services
- ALW Auto Repair
- iMatrix
- Axiom
- Resurge Solutions
- JNIT
- HCL Global Systems
- ArksTech, Inc., Aurora, CO
- iPolarity, LLC, Piscataway, NJ
- iShift Corp., Fremont, CA
- Crowd Software Consulting, LLC, Commerce, TX
- Avco Consulting, Inc., Worchester, MA
- Intone Networks, Inc., Iselin, NJ
- Ecom Consulting, Inc., Plano, TX
- eliteIT
- STS Sparsity Systems, Suwanee, GA

- UNIGO, Inc., Irving, TX
- CBN Tech Force, Irving, TX

Current and recent externally supported projects include:

- **The Development of Synthetic Application Failure Effect Testing and Investigation Program (SAFETIP) for Improved Safety Training and Accident Investigations**
  Funded by: Eastern Illinois University Proposal Initiative Fund with nearly $4,000 in external material donations for testing
  Principal Investigator: Dr. Isaac Slaven
  EIU Team Members: Kyle Wathen

- **Evaluate Feasibility of Sustainable and Economical Utilization of Biomass Gasification Byproducts**
  Funded by: Illinois Sustainable Technology Center (ISTC) at University of Illinois at Urbana-Champaign
  Collaborators: Mr. Vinod Patel and Dr. BK Sharma at ISTC
  Principal Investigator: Peter Ping Liu
  Project Leader: Dr. Mori Toosi
  EIU Team Members: Jonathan Blitz, Tom Canam, Jerry Cloward, Karen Gaines, Douglas Klarup, Peter Ping Liu, David Melton

- **Exploratory Study on Gasification of Pelletized Grassy Biomass**
  Funded by: Illinois Sustainable Technology Center (ISTC) at University of Illinois at Urbana-Champaign
  Collaborators: Dr. Kishore Rajagopalan and Dr. BK Sharma at ISTC
  Principal Investigator: Peter Ping Liu
  Project Manager: Dr. Jerry Cloward
  EIU Team Members: Rendong Bai, Jonathan Blitz, Tom Canam, Jerry Cloward, Karen Gaines, Douglas Klarup, Peter Ping Liu, David Melton

- **Biomass Pelletization**
  Sponsored by: A New Leaf Energy
  Principal Investigator: Peter Ping Liu
  Project Leader: Dr. Isaac Slaven
  EIU Team Members: Jerry Cloward, Peter Ping Liu, David Melton

- **Enhancing Undergraduate Education Through Student-Led Research in Biomass Renewable Energy**
  Sponsored by: National Science Foundation
  Principal Investigator: Peter Ping Liu
  Project Evaluator: Dr. Rose Gong
  EIU Team Members: Rendong Bai, Jerry Cloward, Peter Ping Liu, David Melton, Isaac Slaven

- **Homeland Security Scholarship for EIU to Support the Graduate Certification Program on Technology Security:**
  Caterpillar Inc. contributed funds to establish a scholarship on Homeland Security to support the Graduate Certification Program on Technology Security. The scholarship is managed by the Provost Office at EIU.

- **Switchgrass pellets:**
  FDC Enterprise donated 1200 lb of switchgrass pellets to be used for research and TEC 5533 Biomass Gasification class.

Criterion 4: Sustained achievements in research/creative activity with graduate students and faculty

4.a.i. Research Productivity: Has an annual research productivity goal and documents that its candidates meet or exceed the completion of those products

In consultation with the faculty chair, the graduating student may elect one of the following three options to fulfill the requirement of certification of comprehensive knowledge (CCK).

Option 1: Case Study:

Definition and Scope:

A student will research and identify a reality-based case (extended example). S/he is expected to present solution(s) to demonstrate how the knowledge, principles, and tools learned during the graduate study may be applied to solve problems or to resolve practical issues. The case should be an actual case based upon candidate's professional experience and/or personal experience, or literature review. Concepts and principles from at least four (4) graduate courses should be integrated into the case. A final paper and a presentation are required.

Option 2: Capstone Project or Project-Based Activity:

Definition and Scope:
A student will engage in a capstone project or project-based activity. S/he is expected to develop and deliver a technology-related project/product including mission definition, project scope and measurable outcomes. Examples of the project could be (but are not limited to): developing a secured online ordering system, an online marketing web site, a networked telephony system, a face recognition system, a training program, or a quality management system for an organization. Students are expected to fully document the project and present the final products, including the paper, to the committee. A final paper and a presentation are required.

Option 3: Mini-Thesis or Research

Definition and Scope:
A student will engage in a scholarly investigation, similar to but not as intensive as thesis research. The student is expected to conduct literature research, design their experiment or research instrument, perform the research or experiments, collect and analyze the data, and write a report regarding the research. The research topic has to be related to career and technical education, computer technology, technology management, or training and development. A final paper and a presentation are required.

Appendix 4.a.i.1 documents recent graduate theses by students in the program.

4.a.ii. Research Engagement: Graduate candidates achieve a sustained record of scholarship through presentations, performances, or exhibits

The School of Technology graduate students have a record of presenting and publishing at various conferences over the years. A complete listing of the citations for these presentations and publications is in **Appendix 4.a.ii.1**.

Among the conferences where graduate students have presented since fall 2008 are:
- 2008 HighEdWeb, Springfield, MO
- 2009 Conference of the Association of Technology, Management, and Applied Engineering (ATMAE), Louisville, KY
- 2009 3rd International Conference on Pattern Recognition and Machine Intelligence, Delhi, India
- 2009 International Conference on Applied Modeling and Information Security Systems, Birmingham, AL
- 2010 Conference of the Association of Technology, Management, and Applied Engineering (ATMAE), Panama City Beach, FL

- 2011 Conference of the Association of Technology, Management, and Applied Engineering (ATMAE), Cleveland, OH
- 2012 Applied Learning Technologies National Conference, Orlando, FL
- 2012 Midwest EDUCAUSE
- 2012 Conference of the Association of Technology, Management, and Applied Engineering (ATMAE), Nashville, TN
- 2013 246th American Chemical Society National Conference, Indianapolis, IN
- 2013 Conference of the Association of Technology, Management, and Applied Engineering (ATMAE), New Orleans, LA
- 2014 Conference of the Association of Technology, Management, and Applied Engineering (ATMAE), St Louis, MO

Refereed publications and proceedings that include graduate students
- The Journal of Human Resource and Adult Learning
- Online Journal of Workforce Education and Development
- 2009 ATMAE Conference Proceedings
- PReMI 2009, Lecture Notes in Computer Science
- 2010 ATMAE Conference Proceedings
- The Journal of Global Business Management
- 2011 ATMAE Conference Proceedings
- Quality Progress
- 246th American Chemical Society National Conference Proceedings

In addition to the previously mentioned presentations and publications, each year the School of Technology sponsors a Technology graduate symposium that gives the opportunity for students to present their research in a formal setting. The symposium has taken place in the Grand Ballroom in the Martin Luther King, Jr. University Union.

Program flyers for some previous years of the School of Technology Student Research Symposium at in **Appendix 4.a.ii.2**

4b. Sustained Commitment to Research and Travel Grants and Graduate School Programs: A record of sustained participation in the annual Graduate School research and travel grants that includes both applications for awards and a record of earning awards.

Numerous graduate students are sponsored to attend the Association for Technology, Management, and Applied Engineering Annual Conference each fall to present their research. In addition, the following students have been awarded Williams Travel Grants through the Graduate School:
- 2008 (Fall) Uros Marjanovic

- 2009 (Spring) Patrick Walser
- 2011 (Fall) Muhammad Rizwan
- 2012 (Fall) Muhammad Rizwan
- 2013 (Fall) Wei Wang
- 2013 (Fall) Kent Martin
- 2014 (Fall) Rajani Pingili
- 2014 (Fall) Rajasri Pingili
- 2014 (Fall) Khalilinejad Seyedramin

4c. Sustained Commitment to Showcasing Graduate Scholarship/Creative Activity: Showcases graduate research and scholarship through a sustained commitment to the Graduate Exposition by requiring students and faculty to participate

In recent years the School of Technology has been represented at the Graduate Exposition. Work that has been showcased includes:

- Patrick Lyons, "Biomass Pelletization," *Showcase EIU 2013*, April 4, 2013.
- Wei Wang, "An Energy Conversion Efficiency Comparison of Arundo Donax (Giant Reed) and Woodchips Gasification as Renewable Energy," *Showcase EIU 2013*, April 4, 2013.
- Kyle Zimmerman, "Biomass Gasification: A Clean and Efficient Way to Harvest Renewable Energy," *Showcase EIU 2012*, April 13, 2012.
- Chengdong Hu, "Investigation of Local Biomass Resources for Sustainable Energy," *Showcase EIU 2012*, April 13, 2012.
- Wei Wang, Jerry Cloward, Rendong Bai, and Peter Liu, "A Laboratory Biomass Gasification System," *EIU 2012 Renewable Energy Symposium*, March 16, 2012.

4d. Sustained Record of Award Program Participation: Demonstrates participation in the Graduate School's Distinguished Awards Program with evidence of nominations, applications, and achievements

The School of Technology Graduate Program has been active in the Graduate School's Distinguished Awards Program. Award winners from the past five years are listed in **Table 4** on the following page:

Table 4: Historical M.S. in Technology Graduate School Award Winners

2010 Distinguished Awards Program	
Name	Award
Joseph Tillman	Distinguished Technology Graduate Student (On-Campus)
Christina Frye	Distinguished Technology Graduate Student (Off-Campus)
Joseph Tillman	King-Mertz Research/Creative Activity Award of Excellence
2011 Distinguished Awards Program	
Name	Award
Aaron Melton	Distinguished Technology Graduate Student (On-Campus)
Edward Karr	Distinguished Technology Graduate Student (Off-Campus)
2012 Distinguished Awards Program	
Name	Award
Robert Raschke	Distinguished Technology Graduate Student (On-Campus)
Ralph Kuchenbrod	Distinguished Technology Graduate Student (Off-Campus)
Muhammad Rizwan	Williams Travel Award
Kim Ensign	President Graduate Student Advisory Council
Dr. Peter Ping Liu	Graduate School Leadership Award
2013 Distinguished Awards Program	
Name	Award
Wei Wang	Distinguished Technology Graduate Student (On-Campus)
Lori Sprague	Distinguished Technology Graduate Student (Off-Campus)
Muhammad Rizwan	Williams Travel Award
Wei Wang	Williams Travel Award
2014 Distinguished Awards Program	
Name	Award
Matthew Maher	Distinguished Technology Graduate Student (On-Campus)
Cyndia Hinton	Distinguished Technology Graduate Student (Off-Campus)
Kent Martin	Williams Travel Award

Criterion 5: Sustained record of opportunities for the discovery and application of knowledge; graduate faculty members reflect the University's teaching and mentoring priority and have a record of research/creative activity and professional service

5.a. Sustained Record of Coordinator Leadership: The Graduate Coordinator has a sustained record of leadership.

Dr. Peter Ping Liu, the School of Technology Graduate Coordinator, has maintained an exemplary record of leadership through extra-mural funding and working to increase the number of graduate students in the program.

Among the recent awards that Dr. Liu has earned in recent years are:

- 2014 Association of Technology, Management, and Applied Engineering (ATMAE) Faculty Excellence Award Winner (1 Nationally)
- 2013 Edwin L. "Bud" May Award for Outstanding Achievement in Research and Grants Award Winner
- Graduate Education Leadership Award, MS Sustainable Energy, Eastern Illinois University, April, 2012.
- The William G. Kirk International Leadership Award, Eastern Illinois University, April 2009.
- Technology in Research and Scholarship Award, Eastern Illinois University, Feb. 2006.
- Excellence in Use of Technology, Eastern Illinois University, Oct. 2003.
- Graduate Education Leadership Award, the Graduate School, Eastern Illinois University, April, 2003.

Additionally, Dr. Liu is the Director of the Center for Clean Energy Research and Education (CENCERE) at Eastern Illinois University, which was approved by the Illinois Board of Higher Education (IBHE) in 2011. CENCERE is a collaborative effort to integrate learning of students from Biological Sciences, Business, Chemistry, Communication Studies, Economics, English, Geology & Geography, Physics, Political Science, and Technology with opportunities presented by the Renewable Energy Center (REC) at EIU. CENCERE's mission is as follows:

1. To support the energy needs of the campus by way of a sustainable operation of the Renewable Energy Center.
2. To support the faculty collaborative research across the entire university on clean energy.
3. To engage students in their study of clean energy as a means to be educated in environmental protection, natural resource preservation, social responsibilities and solutions.
4. To become a leader in clean energy research and education in the nation.

Appendix 5.a.1 shows the recently submitted IBHE Progress Report of the multidisciplinary CENCERE center.

5.b. Sustained Graduate Faculty Scholarship: Graduate faculty are active scholars in the discipline and can document a sustained record of scholarship and extra-mural funding.

The School of Technology posts faculty highlights annually on the School of Technology's website. The complete listing for the last few years is in **Appendix 5.b.1**. Some highlights from the last year include:

- A collaborative grant from the National Science Foundation for nearly $200,000.
- Fifteen (15) refereed journal articles and conference proceedings
- Two (2) books

- Twenty Five (25) conference presentations
- Organized on-campus symposium called "Revolutions in Science and Technology Paradigms"

Conclusion

The M.S. in Technology program has kept current with the rapidly changing field of technology. As a result of its continuous improvement using feedback from regional employers, graduates, and the assessment process at Eastern, the program has become a first choice for many prospective domestic and international students. Its steady enrollment growth from 65 students in AY 2000 to 183 students in AY 2014 (See **Figure 1**), demonstrates how more students are selecting the M.S. in Technology program as their first choice for a graduate degree.
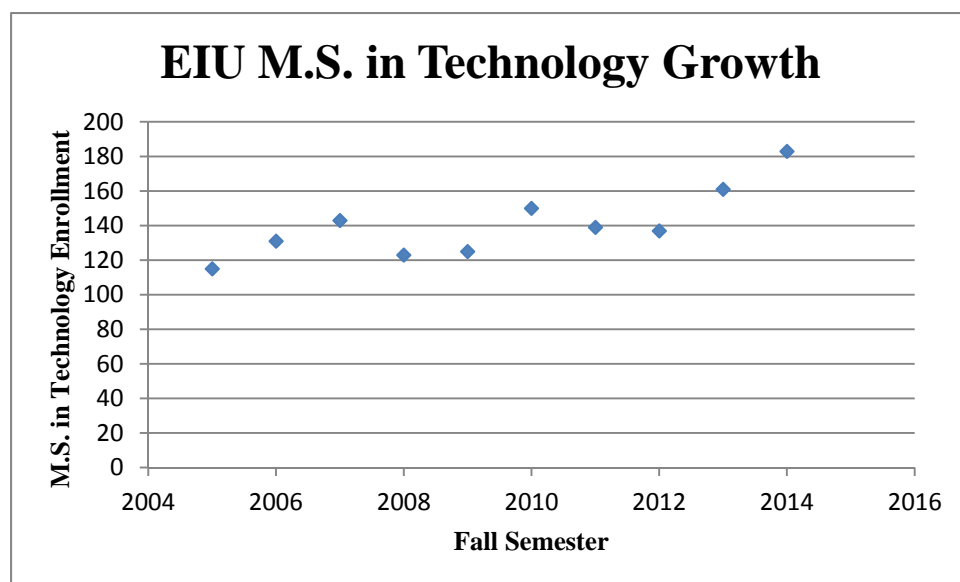

Figure 1: EIU M.S. in Technology Enrollment Trend