Self-Study Report

for the

Bachelor of Science in Technology Management

at

Texas A&M University-Commerce

2008-2012

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Self-Study Report for the Bachelor of Science in Technology Management
Texas A&M University-Commerce

1.0 INTRODUCTION TO THE DEPARTMENT / PROGRAM

Texas A&M University-Commerce (A&M-Commerce) is the fifth oldest state university in Texas. It serves the Northeast Texas region bordered by Oklahoma to the north, Arkansas and Louisiana to the east, and the Dallas-Fort Worth (DFW) Metroplex to the west. A&M-Commerce offers majors at the undergraduate, master's and doctoral levels. Approximately 89% of the over 11,000 students in the A&M-Commerce student body comes from a 38-county area in East and Northeast Texas. Many of the 272 school districts within this region are rural with a majority of financially disadvantaged students. The Texas Education Agency classified 54.8% of these school districts as either rural or non-metropolitan schools. In addition to the area high schools, A&M-Commerce actively recruits transfer students from the nearly 140,000 students in community/junior colleges within the university's service area.

Building upon successful technology programs of more than 20 years, A&M-Commerce received approval for and implemented the Bachelor of Science in Technology Management program in 2000. The Technology Management program is housed under the Department of Engineering & Technology. The Department is one of seven departments under the College of Science, Engineering, & Agriculture, which allows for the alignment and synergy between Science, Technology, Engineering, and Mathematics (STEM) programs. The organizational structure for the Technology Management program is shown in Figures 1-1 and 1-2.

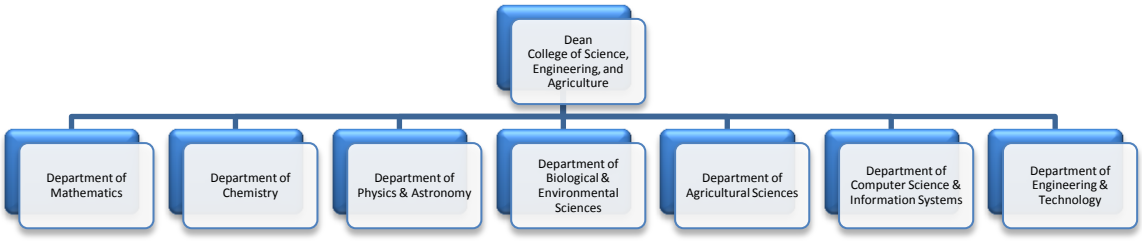


Figure 1-1: College of Science, Engineering, & Agriculture Organizational Structure

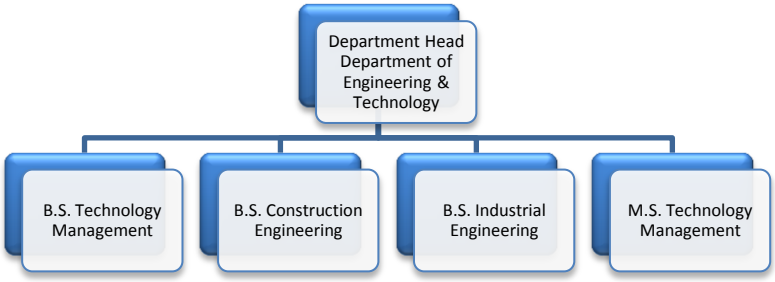


Figure 1-2: Department of Engineering & Technology Organizational Structure

The Technology Management is 121 hour program that integrates technology, applied engineering, project management, cost engineering, quality, business management, and leadership to prepare individuals for a variety of business, construction, and industrial careers. Graduates are suited for professional positions where the solving of complex technological problems; management of the environment, processes and workforce; controlling cost and resources; and insuring a safe and ergonomically correct workplace are essential. Program graduates are prepared for and encouraged to continue their education after the awarding the B.S. degree by obtaining the Master of Science degree in Technology Management.

1.1 Action Items from Previous Program Reviews

There were no action items and/or formal recommendations from a prior program review. However, there have been program revisions over the past five years, which are described in detail in section 1.3.

1.2 Enrollment Trends

The undergraduate enrollment in the Department of Engineering & Technology has been trending upward since 2008, as shown in Figure 1-3.

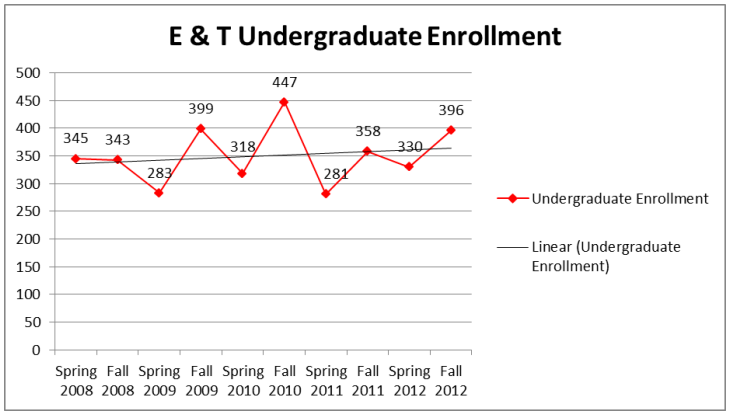


Figure 1-3: Department of Engineering & Technology Undergraduate Enrollment

The fluctuation between Fall and Spring enrollments is due in large part to the structure of the engineering curricula. The first engineering courses in both the industrial and construction engineering programs are not taken until the Fall semester of the second year. A computer-aided design course, IT 111, is required in each of the undergraduate programs, including technology management. This course does not have a mathematics requirement and is typically taken in the first Fall semester. Fall enrollment in IT 111 averages 70-75 students. A large portion of the engineering students do not take any department courses in the following Spring semester, which results in the Spring enrollment decline.

Like all of the undergraduate programs in the department, the number of Technology Management majors has increased since 2008, as shown in Figure 1-4. While the growth is encouraging, the Department recognizes the need for additional majors to sustain the program. The Department's 5-year strategic plan includes a target of 100 majors for the BS Technology Management degree.

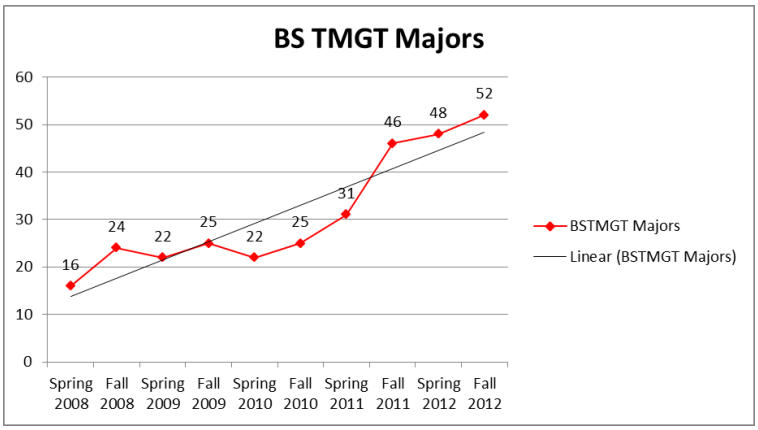


Figure 1-4: Bachelor of Science in Technology Management Majors

The number of majors in the BS TMGT program declined to a critical level during the 2006-2008 timeframe. This was due in part to a lack of marketing efforts at a period when there was some turnover in the program faculty. The small number of majors is reflected in the recent number of graduates, as shown in Figure 1-5. It should be noted that even with the lower number of graduates, the BS TMGT program produced 36 graduates over the past 5 years, which exceeds the Texas Higher Education Coordinating Board's requirement of 25 graduates over a five year period. The program is fully staffed and an emphasis has been placed on promoting the program, which has resulted in the growth in the number of majors. There is a 4-5 year delay before graduates are realized but the growth in majors will result in an increase in the number of degrees awarded.

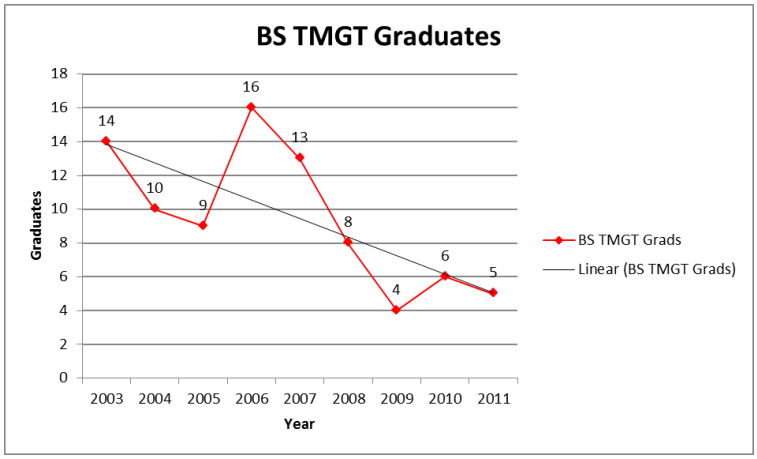
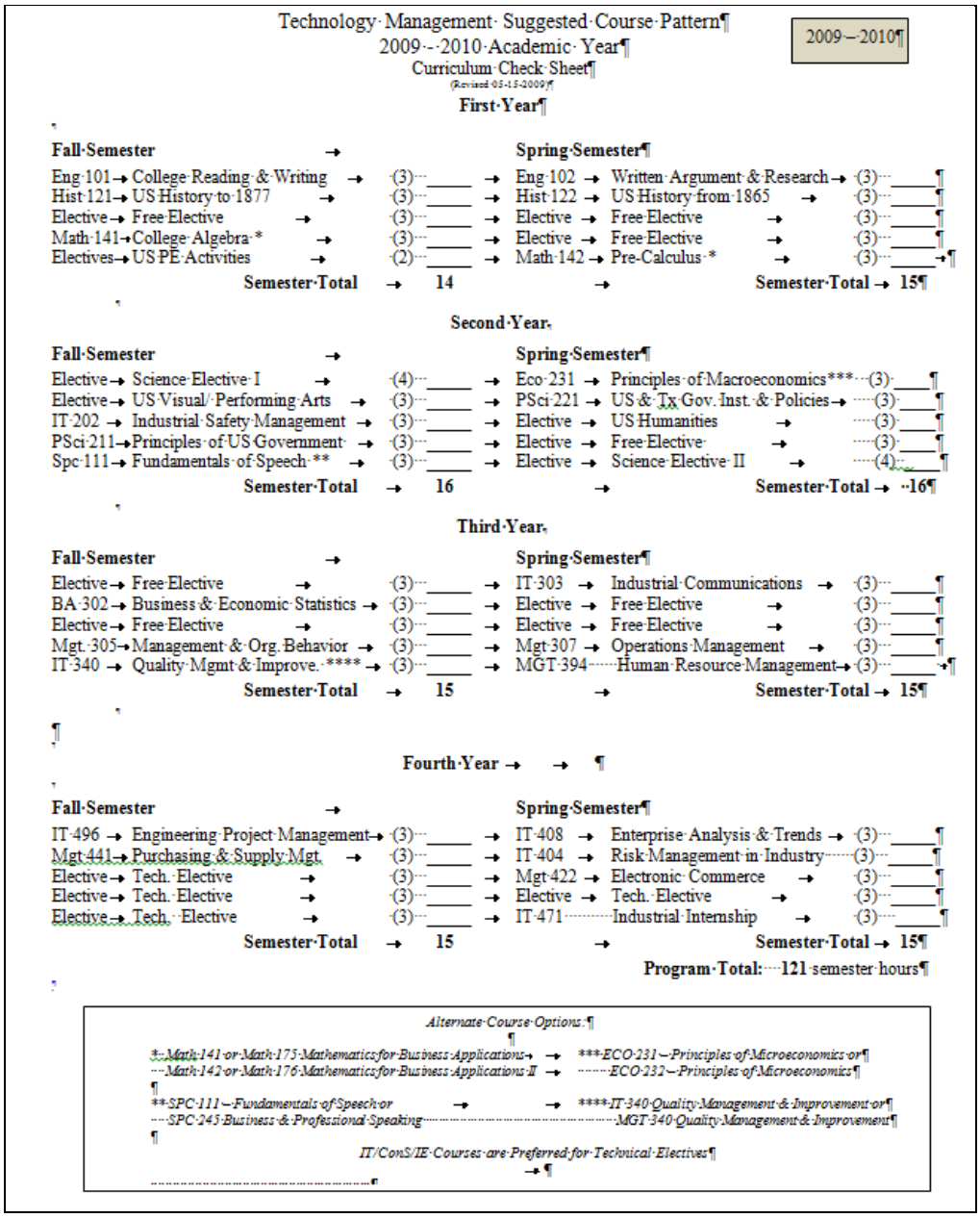


Figure 1-5: Bachelor of Science in Technology Management Degrees Awarded

1.3 Program Changes or Enhancements

Prior to 2010, the BS Technology Management program was designed to prepare students for a broad array of business and industrial careers through a curriculum that integrated industrial technology, technical management, production management, production, and operations. The degree plan is shown in Figure 1-6.



Technology Management Suggested Course Pattern
2009 – 2010 Academic Year
Curriculum Check Sheet
(Revised 05-15-2009)

2009 – 2010

First Year

Fall Semester			Spring Semester		
Eng 101	College Reading & Writing	(3)	Eng 102	Written Argument & Research	(3)
Hist 121	US History to 1877	(3)	Hist 122	US History from 1865	(3)
Elective	Free Elective	(3)	Elective	Free Elective	(3)
Math 141	College Algebra *	(3)	Elective	Free Elective	(3)
Electives	US PE Activities	(2)	Math 142	Pre-Calculus *	(3)
	Semester Total	14		Semester Total	15

Second Year

Fall Semester			Spring Semester		
Elective	Science Elective I	(4)	Eco 231	Principles of Macroeconomics***	(3)
Elective	US Visual/Performing Arts	(3)	PSci 221	US & Tx Gov. Inst. & Policies	(3)
IT 202	Industrial Safety Management	(3)	Elective	US Humanities	(3)
PSci 211	Principles of US Government	(3)	Elective	Free Elective	(3)
Spc 111	Fundamentals of Speech **	(3)	Elective	Science Elective II	(4)
	Semester Total	16		Semester Total	16

Third Year

Fall Semester			Spring Semester		
Elective	Free Elective	(3)	IT 303	Industrial Communications	(3)
BA 302	Business & Economic Statistics	(3)	Elective	Free Elective	(3)
Elective	Free Elective	(3)	Elective	Free Elective	(3)
Mgt 305	Management & Org. Behavior	(3)	Mgt 307	Operations Management	(3)
IT 340	Quality Mgmt & Improve. ****	(3)	MGT 394	Human Resource Management	(3)
	Semester Total	15		Semester Total	15

Fourth Year

Fall Semester			Spring Semester		
IT 496	Engineering Project Management	(3)	IT 408	Enterprise Analysis & Trends	(3)
Mgt 441	Purchasing & Supply Mgt.	(3)	IT 404	Risk Management in Industry	(3)
Elective	Tech. Elective	(3)	Mgt 422	Electronic Commerce	(3)
Elective	Tech. Elective	(3)	Elective	Tech. Elective	(3)
Elective	Tech. Elective	(3)	IT 471	Industrial Internship	(3)
	Semester Total	15		Semester Total	15

Program Total: 121 semester hours

Alternate Course Options

: Math 141 or Math 175 Mathematics for Business Applications → *: ECO 231 – Principles of Microeconomics or*
Math 142 or Math 176 Mathematics for Business Applications II → ECO 232 – Principles of Microeconomics

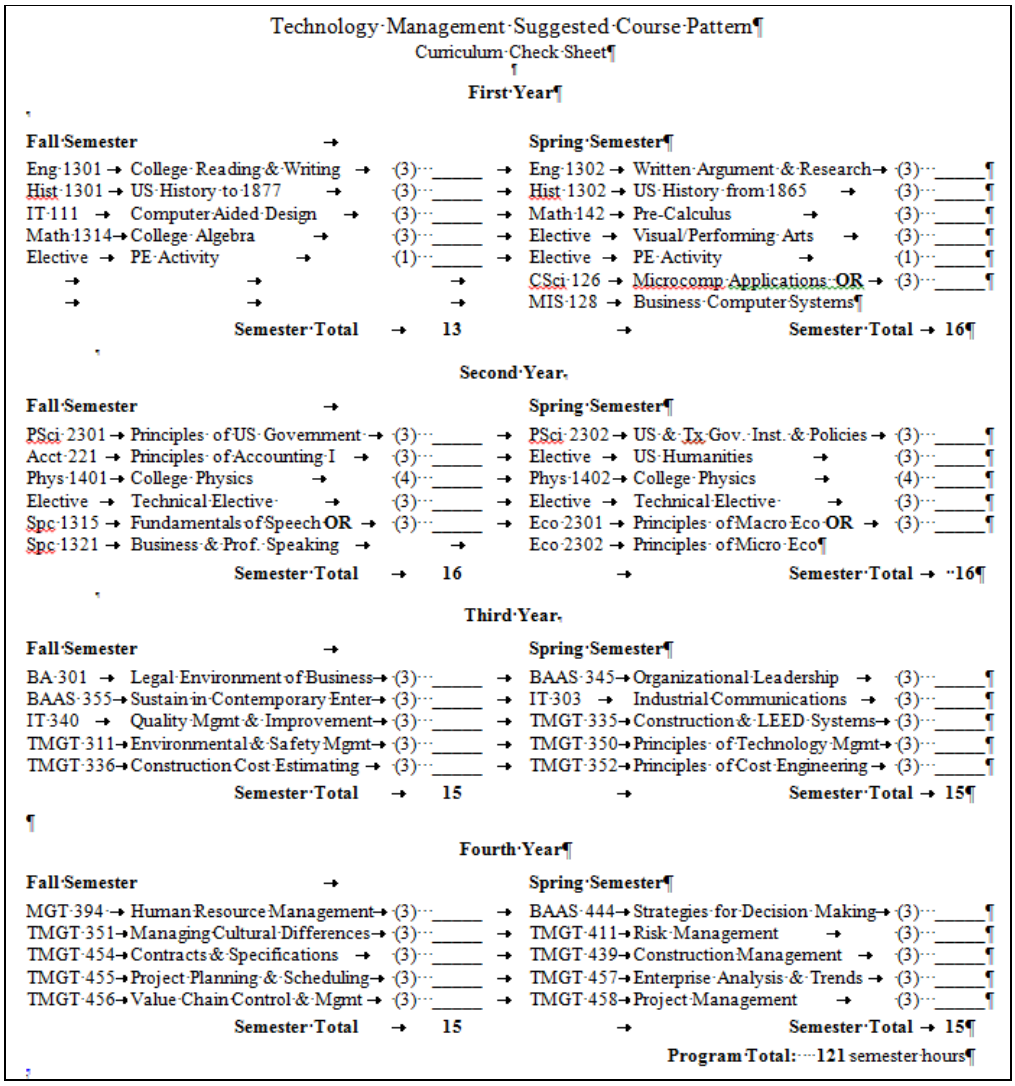
: SPC 111 – Fundamentals of Speech or → *: IT 340 Quality Management & Improvement or*
SPC 245 Business & Professional Speaking MGT 340 Quality Management & Improvement

IT/ConS/IE Courses are Preferred for Technical Electives

Figure 1-6: 2009-2010 BS Technology Management Degree Plan

The inclusion of the large number of electives, both technical and free, was done intentionally to provide the greatest flexibility to customize the degree to specific

interests and/or career fields. The objective was to allow individuals to select a set of courses that would result in a set of skills and knowledge best suited for their target field. Upon assessment of the graduates from that time period, the faculty noted that the flexibility was being used as a means to a "path of least resistance" to graduation rather than developing a focused field of study. The faculty determined that it was in the best interest of the students to revise the curriculum to remove a majority of the electives and replace them with required courses that reflected industry needs. A revised curriculum was developed based upon research and stakeholder input, which is shown in Figure 1-7.



Technology Management Suggested Course Pattern

Curriculum Check Sheet

First Year

Fall Semester			Spring Semester		
Eng 1301	College Reading & Writing	(3)	Eng 1302	Written Argument & Research	(3)
Hist 1301	US History to 1877	(3)	Hist 1302	US History from 1865	(3)
IT 111	Computer Aided Design	(3)	Math 142	Pre-Calculus	(3)
Math 1314	College Algebra	(3)	Elective	Visual/Performing Arts	(3)
Elective	PE Activity	(1)	Elective	PE Activity	(1)
			CSci 126	Microcomp Applications OR	(3)
			MIS 128	Business Computer Systems	
	Semester Total	13		Semester Total	16

Second Year

Fall Semester			Spring Semester		
PSci 2301	Principles of US Government	(3)	PSci 2302	US & Tx Gov. Inst. & Policies	(3)
Acct 221	Principles of Accounting I	(3)	Elective	US Humanities	(3)
Phys 1401	College Physics	(4)	Phys 1402	College Physics	(4)
Elective	Technical Elective	(3)	Elective	Technical Elective	(3)
Spc 1315	Fundamentals of Speech OR	(3)	Eco 2301	Principles of Macro Eco OR	(3)
Spc 1321	Business & Prof. Speaking		Eco 2302	Principles of Micro Eco	
	Semester Total	16		Semester Total	16

Third Year

Fall Semester			Spring Semester		
BA 301	Legal Environment of Business	(3)	BAAS 345	Organizational Leadership	(3)
BAAS 355	Sustain in Contemporary Enter	(3)	IT 303	Industrial Communications	(3)
IT 340	Quality Mgmt & Improvement	(3)	TMGT 335	Construction & LEED Systems	(3)
TMGT 311	Environmental & Safety Mgmt	(3)	TMGT 350	Principles of Technology Mgmt	(3)
TMGT 336	Construction Cost Estimating	(3)	TMGT 352	Principles of Cost Engineering	(3)
	Semester Total	15		Semester Total	15

Fourth Year

Fall Semester			Spring Semester		
MGT 394	Human Resource Management	(3)	BAAS 444	Strategies for Decision Making	(3)
TMGT 351	Managing Cultural Differences	(3)	TMGT 411	Risk Management	(3)
TMGT 454	Contracts & Specifications	(3)	TMGT 439	Construction Management	(3)
TMGT 455	Project Planning & Scheduling	(3)	TMGT 457	Enterprise Analysis & Trends	(3)
TMGT 456	Value Chain Control & Mgmt	(3)	TMGT 458	Project Management	(3)
	Semester Total	15		Semester Total	15

Program Total: 121 semester hours

Figure 1-7: Revised BS Technology Management Degree Plan

The Association of Technology Management and Applied Engineering (ATMAE) is the leading accreditation body for technology management and related programs. As defined in the ATMAE Accreditation Handbook, accredited programs must be a minimum of 120 semester hours and meeting all foundation requirements, which includes general education, mathematics, physical sciences, management, and

technical courses. As part of an ongoing quality enhancement effort, the revised BS Technology Management curriculum was benchmarked against the ATMAE foundation requirements to validate the curriculum is aligned with industry needs. The benchmark results are shown in Table 1-1.

Table 1-1: ATMAE Benchmark Results

ATMAE			
ATMAE Foundation Requirements	Hours		TAMU-C Technology Management
General Education	18-36		University Studies (excluding Math and Physical Sciences) Industrial Communications (IT 303)
Mathematics	6-18		College Algebra (MATH 1314) Pre-Calculus (MATH 142)
Physical Sciences	6-18		College Physics I (PHYS 1401) College Physics II (PHYS 1402)
Management	12-24		
Quality Management			Quality Management & Improvement (IT 340)
Quality Control			Quality Management & Improvement (IT 340)
Production Planning & Control			Principles of Cost Engineering (TMGT 352) Project Planning & Scheduling (TMGT 455) Value Chain Control & Management (TMGT 456)
Supervision			Strategies for Decision Making (BAAS 444) Principles of Technology Management (TMGT 350) Human Resource Management (MGT 394) Managing Cultural Differences (TMGT 351)
Finance/Accounting			Principles of Accounting I (ACCT 221) Macro Economics (ECO 2301) OR Micro Economics (ECO 2302) Principles of Cost Engineering (TMGT 352)
Safety Management			Environmental & Safety Management (TMGT 311) Risk Management (TMGT 411)
Facilities Layout			
Materials Handling			Value Chain Control & Management (TMGT 456)
Legal Aspects/Law			Legal Environment of Business (BA 301) Strategies for Decision Making (BAAS 444) Contracts & Specifications (TMGT 454) Enterprise Analysis & Trends (TMGT 457)
Marketing			
Leadership			Organizational Leadership (BAAS 345) Principles of Technology Management (TMGT 350)
Project Management			Project Management (TMGT 458) Construction Cost Estimating (TMGT 336) Principles of Cost Engineering (TMGT 352) Human Resource Management (MGT 394) Contracts & Specifications (TMGT 454) Project Planning & Scheduling (TMGT 455) Construction Management (TMGT 439)
International Business			Sustainability in Contemporary Enterprises (BAAS 355) Managing Cultural Differences (TMGT 351) Enterprise Analysis & Trends (TMGT 457)
Teaming			*Integrated into curriculum*
Technical	24-36		
Computer Integrated Manufacturing			*Covered in IT 112 if taken as a technical elective**
Computer Aided Design			Computer Aided Design (IT 111)
Electronics			College Physics II (PHYS 1402)
Materials Science/Testing			Construction & LEED Systems (TMGT 335)
Computer Technology			Microcomputer Applications (CSCI 151) OR Business Computer Systems (MIS 128)
Packaging & Distribution			Sustainability in Contemporary Enterprises (BAAS 355)
Construction Manufacturing Processes			Construction & LEED Systems (TMGT 335) Construction Management (TMGT 439)
Electives	0-18		Technical Electives
*IT 112 is a recommended technical elective			
Minimum program hours	120		
TAMU-C TMGT Hours	121		

2.0 DEPARTMENT PLANNING AND STRUCTURE

University Mission Statement

Texas A&M University-Commerce provides a personal educational experience for a diverse community of life-long learners. Our purpose is to discover and disseminate knowledge for leadership and service in an interconnected and dynamic world. Our challenge is to nurture partnerships for the intellectual, cultural, social, and economic vitality of Texas and beyond.

University Guiding Principles

Diversity: Foster a culture of inclusion which attracts to our university highly qualified students, faculty, and staff who represent the diversity of the region we serve, and who will engage with us in the pursuit of our university's vision and mission.

Service: Promote excellence in service to members of all internal and external communities.

Student Success: Pursue and implement effective, research-based strategies that provide all students the resources, support, and high-quality instruction they need to achieve their goal of earning a college degree.

Stewardship: Advance the university by demonstrating the quality of our programs and services to an ever-expanding community of supporters. Leverage the value of public, private, and human resources through business practices that are founded in accountability and transparency, and academic practices that are continuously improved through research, assessment, and innovation.

Globalization: Cultivate an academic environment enlivened by global interconnections that traverse the boundaries of culture, politics, and place.

Research: Strengthen the nexus between teaching and research in ways that speak to the university's imperative both to create and disseminate knowledge.

Communication: Develop a consistent, authentic, and reliable message that effectively conveys our commitment to extending opportunity, transforming lives, and shaping futures through education.

College of Science, Engineering, & Agriculture Mission Statement

Innovation and Discovery. That is our charge and our pledge. The faculty and staff of CoSEA accept the responsibility of building an innovative framework to join our students in building a better Texas eager to compete in an interconnected world with creativity, ethical leadership, and imagination. We don't just discover the future, we make it.

Department of Engineering & Technology Mission Statement

Practical Ingenuity. The framework of the Department of Engineering & Technology, built upon instruction, research, and infusion of real-world experiences, fosters the development of effective problem solvers.

Bachelor of Science in Technology Management Mission Statement

To prepare highly qualified graduates for a variety of technology intensive careers in industry, business, and construction enterprises.

By graduation, BS Technology Management students will demonstrate:

- Applied knowledge of managerial skills and practices in a technology intensive enterprise.
- Effective cognitive and communication skills.

2.1 Goals and Priorities

Building upon a successful history of technology education, the Department of Engineering & Technology began its transition to engineering and technology in 2002 with the implementation of an Industrial Engineering program. Figure 2-1 shows a brief history of the programs within the department.

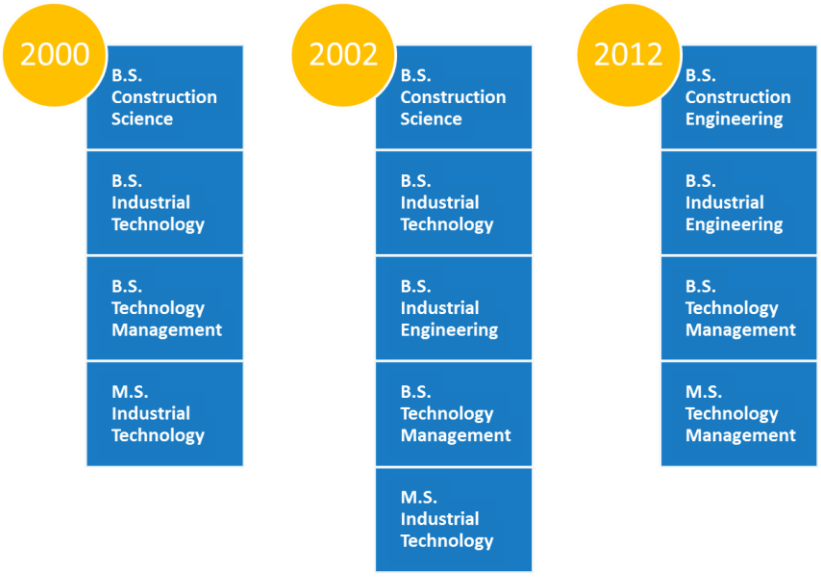


Figure 2-1: Department of Engineering & Technology Program History

As a relatively new department as currently constituted, the department's five-year goals and priorities are primarily focused on sustainable growth in program majors, extramural funding, and faculty lines. An increase in extramural funding will enhance the department's research efforts, both in quantity as well as quality, which align with the University and College missions to *discover and disseminate knowledge*. The impending shortage of engineers and technologists is reflected in the Texas Higher Education Coordinating Board's (THECB) *Closing the Gaps 2015* initiative, which calls for an increase in the number of graduates in key fields, including engineering and technology. A larger number of majors equates to more graduates which aligns with the University's mission to *nurture partnerships for the economic vitality of Texas and beyond.*

Growth in Program Majors

The department has established a **200-200-100** goal for undergraduate programs. This represents a 5-year target of 200 majors in Construction Engineering, 200 majors in Industrial Engineering, and 100 majors in Technology Management. The strategic planning model to reach these stretch goals includes:

- Freshman to Sophomore retention goal: 70% retention (TAMUC average)
- Sophomore to Junior retention goal: 80% (results in 56% university 2-year retention rate)
- Junior to Senior retention goal: 90% (results in ~50% retention to graduation rate, which is approximately the national average)
- Transfer goal: 10 students per year entering sophomore class in each program
- Graduation: Assume 1/3 of students classified as seniors graduate each year
- Freshman class goal: 50 (increase 5 per year until level is reached) for engineering
- Freshman class goal: 25 (increase 5 per year until level is reached) for TMGT

Tables 2-1, 2-2, and 2-3 show the projected number of majors based upon the previous planning model.

Table 2-1: Industrial Engineering Projected Majors and Graduates

	F12	F13	F14	F15	F16	F17	F18
Fresh	23	30	35	40	45	50	50
Soph	24	26	31	35	38	42	45
Junior	21	19	21	25	28	30	33
Senior	37	44	47	50	56	62	69
Total	**105**	**119**	**133**	**149**	**166**	**184**	**197**
Proj Spring Grads	12	14	15	16	18	21	23

Table 2-2: Construction Engineering Projected Majors and Graduates

Fresh	17	25	30	35	40	45	50
Soph	17	22	28	31	35	38	42
Junior	14	14	18	22	25	28	30
Senior	13	21	27	34	42	51	59
Total	**61**	**82**	**102**	**122**	**142**	**161**	**181**
Proj Spring Grads	4	6	8	10	13	15	18

Table 2-3: BS Technology Management Projected Majors and Graduates

Fresh	7	10	15	20	25	25	25
Soph	15	15	17	21	24	28	28
Junior	10	12	12	14	16	19	22
Senior	20	22	26	28	31	36	41
Total	**52**	**59**	**70**	**82**	**96**	**107**	**116**
Proj Spring Grads	6	7	8	8	9	11	12

Growth in Extramural Funding

Despite the challenges presented by not having a thesis-based graduate program, the Department recognizes the importance of having an active research program. The strategic planning model for extramural funding includes:

- Each tenured faculty should receive at least one funded grant at the NSF average in a 5 year period ($165,000 for 3 years or $55,000/year)*
- Tenured faculty will not all receive a funded award in the same year. An average of 1 award per year
- Tenure-track faculty will not receive a funded award in year 1
- Tenure-track faculty will receive the equivalent of a Junior Faculty Research Award in year 2 ($10,000)
- Tenure-track faculty will receive the equivalent of $100,000 in funded research between years 3 and 6 (average $25,000/yr)
- Professional-track faculty will generate external funding through industry supported projects and/or grants

*FY2012 NSF Funding Profile: Average award - $164,300 for 3 year average duration
*TEES projects 2-3 submissions prior to receiving award

Table 2-4 shows the projected extramural funding based upon the previous planning model.

Table 2-4: Department of Engineering & Technology Projected Extramural funding

	Grants	Other Funding	Comments
'09-'10	$18,000	$10,000	THECB, BEST Donations
'10-'11	$22,000	$16,050	THECB, TEXO, BEST donations
'11-'12	$5,000	$29,700	TEXO, BEST donations
'12-'13	$115,000	$25,000	Projected
'13-'14	$170,000	$25,000	Projected
'14-'15	$225,000	$25,000	Projected
'15-'16	$250,000	$25,000	Projected
'16-'17	$210,000	$25,000	Projected

Growth in Faculty Lines

To achieve and sustain the Technology Management targets will require at least one additional faculty member. Over all, the Department of Engineering & Technology will require an additional four (4) faculty lines, including the TMGT line.

2.2 Strengths and Weaknesses

Department of Engineering & Technology

Strengths: Support of the University and College | Faculty | Laboratory space and instructional equipment | Department transfer liaison to support recruitment efforts | One of two Construction Engineering programs in Texas | Industry partnerships | Lion's Pride robotics

Weaknesses: Competitiveness in national grants due to a lack of a thesis-based graduate program | Current number of majors only allows majors courses to be offered once a year | Adequate but small number of faculty in each program |

Opportunities: Engineering and technology school of choice for the large number of ISDs in Northeast Texas | Unique STEM partnerships with regional ISDs and Educational Service Centers | 140,000+ students in service area community / junior colleges |

Threats: Multiple engineering programs within the DFW region | Recruitment challenges with the pervading perception that A&M-Commerce is a teacher's college | Retirement and/or resignation of key faculty |

BS Technology Management Program

Strengths: Unique program for the DFW region | Faculty | Department transfer liaison to support recruitment efforts | Online or on-campus delivery options |

Weaknesses: Lack of clear program mission / definition | Adequate but small number of faculty in each program | Lack of industry partnerships | Defined research areas

Opportunities: Number of majors has grown from 16 to 52 over a 4 year period with focused marketing | Program is easier to align to 2-year programs than engineering | 140,000+ students in service area community / junior colleges |

Threats: Degree is not a common program that graduating seniors commonly consider | Lack of clear employment opportunities for graduates | Retirement and/or resignation of key faculty |

2.3 Faculty Expertise

Instruction in the BS Technology Management program not only draws upon the knowledge and experience of the technology management faculty (4) but also utilizes expertise of the construction engineering faculty. In addition to technology, applied engineering, project management, cost engineering, quality, business management, and leadership, the technology management curriculum integrates construction management principles. All construction related courses are taught by Construction Engineering faculty. Some of the technology management faculty teach graduate level technology management courses as well as the undergraduate courses. The research required in the graduate program enriches the undergraduate instruction.

At the current time, the department does not utilize any adjuncts or graduate assistant teachers. This includes the BS Technology Management program, in which all courses, undergraduate and graduate, are taught by full-time faculty members. In

addition, there is sufficient full-time faculty to support faculty advising, institutional service, and research activities as evidenced by the information provided in Section 2.5, Faculty Productivity.

2.4 Faculty Qualifications

The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) faculty credential guideline for individuals teaching baccalaureate courses is:

Faculty teaching baccalaureate courses: doctorate or master's degree in the teaching discipline or master's degree with a concentration in the teaching discipline (minimum of 18 graduate semester hours in the teaching discipline).

A listing of the major courses in the BS Technology Management program and the faculty members who taught the courses during the past academic year is provided in Table 2-5.

Table 2-5: BS Technology Management Major Courses and Instructors

Course	Title	Fall 2012	Spring 2013	Instructor
IT 111	Computer-Aided Design	X	X	Moler
IT 303	Industrial Communication		X	Anderson
IT 340	Quality Management	X		Altintas-de Leon
TMGT 311	Environmental & Safety Mgt	X		Anderson
TMGT 335	Construction & LEED Sys		X	Tsung
TMGT 336	Construction Cost Estimating	X		Wilson
TMGT 350	Principles of Technology Mgt		X	Moler
TMGT 351	Managing Cultural Differences	X		Anderson
TMGT 352	Principles of Cost Engineering		X	Liu
TMGT 411	Risk Management		X	Anderson
TMGT 439	Construction Management		X	Wilson
TMGT 454	Contracts & Specifications	X		Tsung
TMGT 455	Project Planning & Scheduling	X		Davis
TMGT 456	Value Chain Cntrl & Mgt	X		Davis
TMGT 457	Enterprise Analysis & Trends		X	Davis
TMGT 458	Project Management		X	Davis

All faculty who taught majors courses within the BS Technology Management program over the past academic year met the SACSCOC credential guidelines. Copies of the Faculty Credential forms are provided in Appendix A.

2.5 Faculty Productivity

There are four (4) full-time Technology Management faculty that support the BS Technology Management and MS Technology Management programs (Anderson, Davis, Moler, and Parish). While the number of faculty is small, it is adequate to support the instruction, research & scholarly work, and service associated with the Technology Management programs.

SCH Generation

A total of 1,119 SCH were generated in the BS Technology Management program in 2012-2013. The technology management faculty generated 834 SCH, or 74.5% of these hours, which represents a 20.3% increase from 2011-2012. The additional 285 hours were generated in construction management courses, which were taught by Construction Engineering faculty. In addition, the technology faculty generated over 1,000 SCH in graduate technology management courses in 2012-2013.

Scholarly Activities

In 2012, the technology management faculty authored or co-authored 8 papers, served as peer-reviewers for academic journals, and made 6 conference presentations.

Other related activities included: 1) Submitting a successful $9,450,045 grant on behalf of the Northeast Texas Rural Rail Transportation District, 2) development and implementation of a online QR-based safety program within the department, and 3) development and delivery of three special topic courses.

Service

The technology management faculty actively serve at the university, college, and department levels as well as within the community. Selected examples of service include:

- University Advisory Committee
- University Scholarship Committee
- Institutional Biosafety Officer, Chair
- University Safety Committee
- Faculty Senate
- College Scholarship Committee
- Faculty Workload Policy Revision, College Representative
- College Tenure & Promotion Committee
- Department Strategic Planning Committee
- Department Scholarship Committee
- Department Safety Officer
- Lion's Pride BEST Robotics volunteer
- Northeast Texas Rural Rail Transportation District, Board of Directors
- Hunt County Alliance for Economic Development, member

2.6 Management and Communication

The Department of Engineering & Technology is comprised of four programs, as shown in Figure 1-2. The programs are supported by the Department Head,

department secretary, and a transfer liaison. The department office, faculty, and staff are all housed in the same building, which promotes communication and synergistic activities across programs. Transparency is promoted within the department and there is a collegial environment among faculty and staff. The following selected examples highlight the functionality and philosophy of the department.

Communication

- Department meetings are held prior to the start of each semester to highlight semester goals, priorities, and required activities.
- The Department Head serves on the College of Science, Engineering, & Agriculture's leadership team. Meetings are held every 1st and 3rd Wednesdays of the month. A summary of each meeting is sent to the department faculty and staff to keep them aware of College goals and priorities.
- The faculty senate representative sends a summary of the faculty senate meetings to the department faculty. This is in addition to the published meeting minutes.
- Each program has a faculty advisor. To ensure accurate documentation is maintained for the student records, advisors submit "course permit" requests for undergraduate courses to the department transfer liaison and graduate requests to the department secretary.
- The transfer liaison is the first contact for potential incoming freshmen or transfer students. After working with the students, the transfer liaison introduces and hands off the students to a faculty member within the student's selected program area.
- Transfer students are required to meet with their faculty advisor prior to registering for the first year after they transfer. This is one step to help ensure retention and academic success of the students. After advising, the advisor contacts the transfer liaison to release the registration block.
- Program faculty meet on a regular basis, often weekly, to work on curriculum, assessment, and support activities within their program.

Synergism

- Industry/Student projects involve an interdisciplinary student teams. Examples include a hanger door project and the A&M-Commerce facilities room utilization project.
- The department scholarship committee is comprised of faculty members representing all of the undergraduate programs. Several of the endowments allow recipients to be from any of the undergraduate programs, so each committee member has to review and consider from his/her program as well as the other programs. There were 29 department scholarships awarded in Fall 2012 totaling $20.525. Thirteen (13) of the awards went to Construction Engineering students, 9 to Industrial Engineering students, and 7 to Technology Management students.

- The department hosts two cookouts each semester for all students, faculty, and staff. This provides an opportunity for students to interact with faculty and peers from other programs in a casual environment.
- The Lion's Pride BEST hub hosts a robotic competition annually in October. The program promotes career awareness of engineering and technology through a sports-like robotic competition. In 2012, 29 are middle and high school teams competed. Faculty and students from all department program volunteered as judges and referees for the event, which drew over 500 people.

2.7 Student Advising and Mentoring

Student success is an integral part of the fabric of the A&M-Commerce. The following guiding principle speaks to the commitment of A&M-Commerce to student success.

> *Student Success: Pursue and implement effective, research-based strategies that provide all students the resources, support, and high-quality instruction they need to achieve their goal of earning a college degree.*

Advising

Student success and academic advising begins before the student arrives at A&M-Commerce. Typically, the initial contact with a potential student is made by the department's **Engineering Mentor/Transfer Liaison.** Following this contact, the Engineering Mentor/Transfer Liaison corresponds with the individual through a series of three electronic mailings. The first provides information about the degree programs and career fields as well as general information about applying to the university. The second deals with the rigors of an engineering program and what the student should be doing in advance to be successful, especially in the area of mathematics. The final mail out provides information about the department's articulation agreements and transferring credits. In addition to the electronic correspondence, the Engineering Mentor/Transfer Liaison serves as a clearing center for student questions, making sure they are routed to the appropriate person, both at the department, college, and university levels.

Upon declaring their major, Technology Management students are assigned to a department faculty advisor. For incoming freshman and transfer students with less than 30 credit hours, they are also assigned to a university **Success Coach** as well as the department faculty advisor. Success Coaches serve as academic advisors, as well as assisting students with financial, personal, and career counseling. The goal of the University College is to assist students into college life and to provide guidance until they transition to working directly with their faculty advisor in their major. Freshmen remain under the guidance of the Success Coach until they have completed 1) their first academic year, 2) 24-hours of credit bearing courses, 3) University's basic skills requirements, and 4) declare a major. Transfer students with less than 30 hours, remain assigned to a Success Coach until such time that they 1) complete the University's basic skills requirements, 2) declare a major, and 3) complete 30

semester hours of credit bearing courses. The Technology Management faculty advisor and Success Coaches work closely to ensure students are given the best opportunity to successfully complete the university studies as well as the Technology Management degree requirements. This provides for a smooth transition when the student is transitioned into the department from the University College.

Students remain with the same department faculty advisor throughout the duration of the degree program. Prior to entering their last semester, the advisor meets with the student to review their transcript and degree evaluation/audit. If it is deemed the individual will be eligible for graduation at the end of the semester, the faculty advisor and student complete the graduation checkout forms. The student's records are then reviewed by the Department Head and then the Dean's office before it is submitted to the Graduate Coordinator in the Registrar's office.

Student Success

A student's academic performance and progress is monitored at the university, college, and department levels. The synergistic approach is designed to give the student the services, support, and resources needed to reach their academic goals.

University

The **Student Access and Success One Stop Center** was created to serve students by providing as many resources as possible in one location. Resources include, but are not limited to, 1) tutoring services, 2) career development, 3) counseling center, 4) child care, and 5) international student services. In addition to support services, the university has established a process to monitor student progress and intercede, when possible, to ensure student success.

The **University College** was established to provide students access to guidance and services necessary to be successful at A&M-Commerce. Regardless of their major, students belong to the University College until they complete their first academic year at A&M-Commerce, complete 24 semester hours of college credit courses, complete the University's basic skills requirements, and declare a major. While they are in the University College, students are assigned a Success Coach**.** Success Coaches serve as academic advisors, as well as assisting students with financial, personal, and career counseling. The goal of the University College is to assist students into college life and to provide guidance until they transition to working directly with their faculty advisor in their major.

While students are in the University College, there are a number of formative assessment points designed to trigger vital interventions to assist students with issues that affect academic performance. Prior to the semester mid-term, faculty submit names of students who are earning a grade of "D" or "F". Success Coaches contact these students to try and determine what issues are causing the poor academic performance and to take the corrective action deemed necessary to resolve and/or minimize these issues. In addition to the predetermined monitoring events, faculty

can take preemptive action anytime during the semester by issuing an Academic Alert. When submitted, Success Coaches are alerted immediately via email, allowing the situation to be reviewed and corrective actions taken.

Other departments, such as the athletic department and Trio programs, require additional progress reports, submitted by faculty, that are over and above the University College's processes and procedures.

Department

The Department of Engineering & Technology has the primary responsibility of evaluating a student's performance and progress in the Technology Management's program. The department faculty and staff actively engage and monitor student performance and progress throughout the time they are in the program.

Upon declaring their major as Technology Management, students are assigned to a department faculty advisor. Technology Management students are encouraged to meet with their faculty advisor face-to-face each semester to review their progress and plan course schedules for the next semester. Prior to entering their last semester, the faculty advisor meets with the student to review their transcript and degree evaluation/audit to determine if they are eligible for graduation at the end of the semester.

Career Guidance

The office of Career Development is part of the Student Access and Success One Stop Center. Programs and services offered through Career Development include, but not limited to, resume consultation, mock interviews, career assessment, job search assistance, on-campus interviews, career workshops, and job fairs.

Career guidance is also offered through the department's student organizations and events. Departmental student organizations are encouraged to bring in industry representatives to speak to their organizations and/or attend career related programs offered through professional societies. The department hosts an annual Engineering Day during the national engineering week in February. The all day program consists of guest industry speakers as well as a networking lunch with upper level students and industry representatives.

2.8 Online or Off-Campus Course Offerings

Currently, the Department of Engineering & Technology does not offer any courses at any of the University's off-site locations. There are however, a significant number of technology management courses offered in an online format. Considering feedback from students and the demographics of the students in the major, the faculty determined online offerings would provide greater flexibility for a working student, which represented many of the technology management majors in 2010.

Each major course is evaluated by the faculty to determine if an online, on-campus, or hybrid format will provide the highest quality learning environment for the student. For example, IT 111, Computer-Aided Design, requires specialized engineering software. While this topic is offered in an online format by other institutions, it was determined that making the students purchase the software for home use was not the most cost effective approach for students so it offered as an on-campus course only. If a course is deemed to be a candidate for online delivery, the course is developed with the same standards and requirements as an on-campus course. There is not online faculty and on-campus faculty. Program faculty teach both online and on-campus courses and are expected to maintain the same standards and rigor.

There is an ongoing effort to determine the most effective means to deliver instruction in the Technology Management program. Courses delivered in an online format, or on-campus, may change depending upon instructional methods, student feedback, and student demographics.

3.0 COMMITMENT TO STUDENT LEARNING

3.1 Assessment Process of Student Learning Outcomes

The Student Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program.

By graduation, BS Technology Management students will demonstrate:

- Applied knowledge of managerial skills and practices in a technology intensive enterprise
- Effective cognitive and communication skills

As described in Section 1-3, the Technology Management curriculum was revised in 2010 based upon observations and research from the program faculty. Prior to 2010, the Technology Management degree included a number of electives, both technical and free, to provide a means for students to customize the degree to specific interests and/or career fields. Since the technology management field is so broad, the objective was to allow individuals to select a portion of the courses that would result in a set of skills and knowledge best suited for their target field. Following an assessment of the graduates in that time period, it was determined the flexibility was being used as a means to a "path of least resistance" to graduation rather than developing a focused field of study. The faculty revised the curriculum, replacing a majority of the electives with required courses that reflected industry needs that were determined from research and industry feedback. The faculty decided that since there would be no graduates under the revised degree plan in 2011-2012, the assessment would focus on program validation rather than student learning outcomes. The 2011-2012 assessment plan is shown graphically in Figure 3-1.

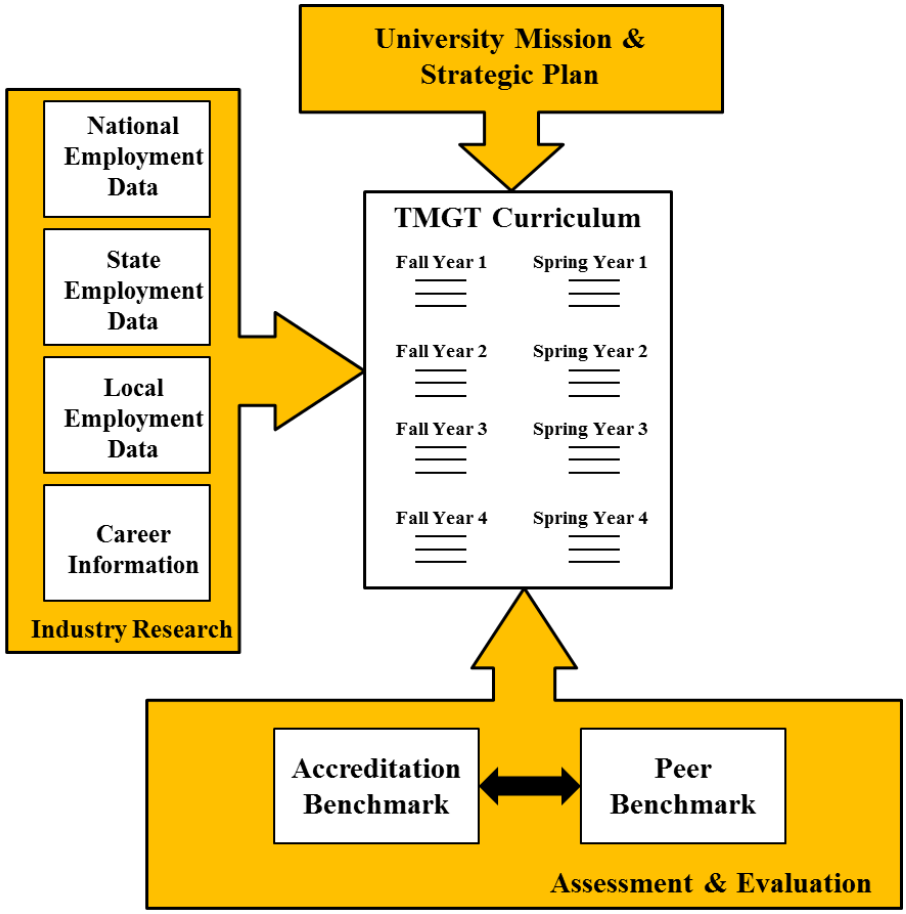


Figure 3-1: 2011-2012 Technology Management Assessment Plan

The Technology Management faculty established an assessment plan for the Student Learning Outcomes for academic year 2012-2013. The curriculum does not have a single capstone course or culminating experience, so the assessment is based upon key upper division courses where the Student Learning Outcomes should be demonstrated. The courses selected for SLO assessment include:

- IT 303, Industrial Communications
- TMGT 350, Principles of Technology Management
- TMGT 458, Project Management

The assessment plan for the Student Learning Outcomes for 2012-2013 is shown in Table 3-1.

Table 3-1: 2012-2013 TMGT Student Learning Outcomes Assessment Plan

Program Mission Statement	Student Learning Outcomes ***for 2012-2013****	University Guiding Principles	Means of Assessment & Criteria for Success*
The mission of the Bachelor of Science in Technology Management is to prepare highly qualified graduates for a variety of technology intensive careers in industry, business, and construction enterprises.	SLO #1 By graduation, BS Technology Management students will demonstrate: - Applied knowledge of managerial skills and practices in a technology intensive enterprise	-Student Success -Stewardship -Research -Communication	Assessment data for each SLO will be collected in three selected upper division courses based on projects and assignments. The three courses specified are taught by a different faculty member so the assessment process will involve the TMGT faculty. A baseline will be established in Spring 2013 and modifications to courses and/or the program will be recommended, as needed, based on the collective findings. The results of the assessments are quantified with a demonstrated 70% achievement goal. Achievement levels below 70% result in a review by the program faculty to determine necessary action.
	SLO #2 By graduation, BS Technology Management students will demonstrate: - Effective cognitive and communication skills	-Student Success -Stewardship	

3.2 Assessment Outcomes

Summary of 2011-2012 Assessment Results

The Association of Technology Management and Applied Engineering (ATMAE) is the leading accreditation body for technology management and related programs. The revised BS Technology Management curriculum was benchmarked against the ATMAE foundation requirements to validate the curriculum is aligned with industry needs. The benchmark results are shown in Table 1-1.

In addition, the revised Technology Management curriculum was benchmarked against seven (7) accredited programs at the following peer institutions.

- Central Connecticut State University
- Indiana State University
- Jackson State University
- Southeast Missouri State University
- St. Cloud State University
- University of Northern Iowa
- University of Wisconsin - Platteville

The influence of local industry produced variations between the different curricula. A "core" was identified using any course offered by 3 or more of the peer institutions. Table 3-2 shows A&M-Commerce's Technology Management program benchmarked against the "core" curriculum from peer institutions.

Table 3-2: ATMAE Accredited Peer Institution Technology Management Benchmark

ATMAE Accredited Technology Management Programs	Central Connecticut State University	Indiana State University	Jackson State University	Southeast Missouri State University	St. Cloud State University	University of Northern Iowa	University of Wisconsin - Platteville			A&M-Commerce
University Studies (Academic Core)	X	X	X	X	X	X	X	100%		X
College Algebra		X	X	X			X	57%		X
Trigonometry	X		X	X				43%		
Statistics	X					X	X	43%		
Chemistry	X	X				X	X	57%		
Physics I	X	X	X	X		X	X	86%		X
Technical Communications	X		X	X	X	X		71%		X
Business law		X	X	X			X	57%		X
Computer Aided Design		X	X	X	X	X	X	86%		X
Computer systems		X	X	X		X	X	71%		X
Construction Methods & Materials				X	X	X	X	57%		X
Construction Codes				X	X		X	43%		X
Industrial Organization		X	X			X		43%		X
Industrial Safety	X	X	X	X		X	X	86%		X
Manufacturing fundamentals		X	X			X		43%		
Production planning and control		X	X		X			43%		X
Quality Assurance/Management	X		X	X		X		57%		X
Risk assessment		X	X				X	43%		X
Supervision		X	X	X		X	X	71%		X
Internship	X		X				X	43%		

A topic 6 or more of the 7 ATMAE schools offer

A topic 5 out of 7 ATMAE schools offer

A topic 4 out of 7 ATMAE schools offer

A topic 3 of the 7 ATMAE schools offer

The following summarizes the evaluation of the benchmark study.

Trigonometry: The A&M-Commerce program requires MATH 142, Pre-Calculus, which covers the learning outcomes of a trigonometry course. The course description is, *Trigonometric functions and their graphs; radian measurement; solution of triangles; identities; logarithmic and exponential functions; trigonometric equations; applications of trigonometry; conic sections and their graphs.*

Statistics: The A&M-Commerce program does not include a statistics course. Basic statistic and probability principles are introduced in the required IT 340, Quality Management course.

Chemistry: The A&M-Commerce program requires two Physics, PHYS 1401 & 1402. It is not shown, but 29% of the schools require electronics courses. PHYS 1402 covers electricity and magnetism, which touches on basic electronic principles.

Manufacturing Principles: The A&M-Commerce does not have a required manufacturing course. The department offers an engineering development and design course, IT 112, which covers basic manufacturing process, including rapid prototyping. Although not required, students are advised to take this course to meet one of the technical elective requirements.

Internship: The A&M-Commerce program does not have a required internship course. The department works with area companies to offer work-based experiences, which are open to all students but not always tied to a course.

Occupational profiles of national, state, and regional employment data was researched through the Texas Workforce Commission's website using the Standardized Occupational Components for Research and Analysis of Trends in Employment System (SOCRATES). The following summarizes the results for select occupations related to the technology management field.

Construction Managers

Dallas Local Workforce Development Area Labor Market Information
Regional Employment 2010: 8,410
Projected Regional Employment 2020: 9,370
Percent Change 2010 - 2020: 11.40%

Texas Labor Market Information
Texas Employment 2010: 69,830
Projected Texas Employment 2020: 79,960
Percent Change 2010 - 2020: 14.50%

National Labor Market Information
National Employment 2010: 523,100
Projected National Employment 2020: 609,600
Percent Change 2010 - 2020: 16.50%

Cost Estimators

Dallas Local Workforce Development Area Labor Market Information
Regional Employment 2010: 1,810
Projected Regional Employment 2020: 2,220
Percent Change 2010 - 2020: 22.70%

Texas Labor Market Information
Texas Employment 2010: 12,790
Projected Texas Employment 2020: 16,160
Percent Change 2010 - 2020: 26.30%

National Labor Market Information
National Employment 2010: 185,400
Projected National Employment 2020: 252,900
Percent Change 2010 - 2020: 36.40%

Industrial Production Managers

Dallas Local Workforce Development Area Labor Market Information
Regional Employment 2010: 1,560
Projected Regional Employment 2020: 1,740
Percent Change 2010 - 2020: 11.50%

Texas Labor Market Information
Texas Employment 2010: 11,640
Projected Texas Employment 2020: 14,170
Percent Change 2010 - 2020: 21.70%

National Labor Market Information
National Employment 2010: 150,300
Projected National Employment 2020: 164,000
Percent Change 2010 - 2020: 9.10%

Health and Safety Engineers

Dallas Local Workforce Development Area Labor Market Information
Regional Employment 2010: 220
Projected Regional Employment 2020: 260
Percent Change 2010 - 2020: 18.20%

Texas Labor Market Information
Texas Employment 2010: 2,200
Projected Texas Employment 2020: 2,530
Percent Change 2010 - 2020: 15.00%

National Labor Market Information

National Employment 2010: 23,700
Projected National Employment 2020: 26,800
Percent Change 2010 - 2020: 13.10%

Based upon the results of the benchmarks and occupational profile data, the faculty feels the BS Technology Management program is aligned with industry needs.

Summary of 2011-2012 Assessment Results

The courses identified to assess the Student Learning Outcomes are offered during the Spring 2013 semester so assessment data is not available for this review.

3.3 Application to University Studies

The University Studies component does not include any course from the Department of Engineering & Technology.

4.0 RECOMMENDATIONS AND IMPLEMENTATION PLAN

4.1 Recommendations

Course outcomes are developed by faculty and are identified in each Technology Management major course syllabus. These outcomes are assessed using various techniques, including, but not limited to, examinations, portfolios, industry-based projects, written reports, and oral presentations. However, with exposure to the ABET accreditation process used for the department's engineering programs and the execution of the recent SLO assessment plans, the technology management faculty have identified some missing elements required for a sustainable assessment process. As a result of this review, a revised assessment process will be developed over the next year. The implementation plan for developing a sustainable assessment process for the BS Technology Management program will be conducted using the following stages:

Stage 1: Program Mission

- Review the existing program mission
- Ensure alignment with the university, college, and department missions
- Revise, if needed

Stage 2: Student Learning Outcomes or Program Outcomes

- Review SLOs and revise as needed
- Ensure outcomes accurately represent the skills, knowledge, and behaviors that graduates are expected to have achieved
- Ensure each SLO includes a single measurable outcome

Stage 3: Course Alignment

- Develop a curriculum map or course crosswalk that shows alignment of the SLOs with program courses
- For each course aligned with an SLO, identify whether elements of the SLO are being introduced, reinforced, or assessed

Stage 4: Assessment Methods

- Determine who each SLO will be assessed and evaluated
- Develop the assessment tools for each SLO assessment

Stage 5: Implementation

- Implement revised plan in the 2013-2014 academic year.

Based upon industry feedback and the research associated with the curriculum benchmark, it was discovered that Building Information Modeling (BIM) is a desired skill set for construction managers as well as construction engineers. As a result, some BIM has been integrated into TMGT 336, Construction Cost Estimating, and TMGT 439, Construction Management.

As described in Section 1-2, the department has established a **200-200-100** goal for undergraduate programs. This represents a 5-year target of 200 majors in Construction Engineering, 200 majors in Industrial Engineering, and 100 majors in Technology Management. The strategic planning model to reach these stretch goals includes:

- Freshman to Sophomore retention goal: 70% retention (TAMUC average)
- Sophomore to Junior retention goal: 80% (results in 56% university 2-year retention rate)
- Junior to Senior retention goal: 90% (results in ~50% retention to graduation rate, which is approximately the national average)
- Transfer goal: 10 students per year entering sophomore class in each program
- Graduation: Assume 1/3 of students classified as seniors graduate each year
- Freshman class goal: 50 (increase 5 per year until level is reached) for engineering
- Freshman class goal: 25 (increase 5 per year until level is reached) for TMGT

Table 2-3 show the projected growth in the number of Technology Management majors based upon the previous planning model. As the number of majors increases, the faculty will continue to monitor the demographics to ensure the program is being offered in a format (online, on-campus, or hybrid) that provides the highest quality learning environment that meets the students' needs.

4.2 Required Resources

Human Resources

To reach and sustain the 200-200-100 majors target, additional faculty lines will be required over the next five years. Currently, a majority of the courses in each undergraduate program are only offered once a year. This is not an issue if a student begins in the Fall semester and never gets out of sequence. However, if a student is unable to take a major course, or has to repeat a course, the time-to-graduation is delayed by at least one year. In order to eliminate this barrier, most of the courses need to be offered every semester, which can be supported by the proposed targets. Table 4-1 shows the faculty required to support the 200-200-100 target.

Table 4-1: Semester Course Schedule & Faculty for 200-200-100 Department Target

CONE 211	CONE Faculty	IE 101	IE Faculty	IT 111.01E	TMGT Faculty
CONE 212	CONE Faculty	IE 201	CONE Faculty	IT 111.02E	TMGT Faculty
CONE 221	CONE Faculty	IE 207	CONE Faculty	IT 111.03E	TMGT Faculty
CONE 231	CONE Faculty	IE 211	IE Faculty	IT 112.01E	TMGT Faculty
CONE 331	CONE Faculty	IE 305	IE Faculty	IT 340.01W	TMGT Faculty
CONE 341	CONE Faculty	IE 311	IE Faculty	TMGT 311.01W	TMGT Faculty
CONE 351	CONE Faculty	IE 312	IE Faculty	TMGT 336	CONE Faculty
CONE 411	CONE Faculty	IE 313	IE Faculty	TMGT 351.01W	TMGT Faculty
CONE 412	CONE Faculty	IE 314	IE Faculty	TMGT 454	CONE Faculty
CONE 421	CONE Faculty	IE 316	IE Faculty	TMGT 455.01W	TMGT Faculty
CONE 422	CONE Faculty	IE 403	IE Faculty	TMGT 456.01W	TMGT Faculty
CONE 423	CONE Faculty	IE 407	IE Faculty	TMGT 510.01E	TMGT Faculty
CONE 425	CONE Faculty	IE 410	IE Faculty	TMGT 510.01W	TMGT Faculty
CONE 431	CONE Faculty	IE 411	IE Faculty	TMGT 514.01W	TMGT Faculty
CONE 432	CONE Faculty	IE 431	Department Head	TMGT 590.01E	TMGT Faculty
CONE 471	CONE Faculty	IE 444	IE Faculty	TMGT 590.01W	TMGT Faculty
		IE 471	IE Faculty	TMGT 595.01W	Department Head
		IE 486	IE Faculty	TMGT 599.01E	TMGT Faculty
		IE 495	IE Faculty	TMGT 599.01W	TMGT Faculty

The projected increase in faculty lines is shown in Table 4-2.

Table 4-2: Current and Proposed Faculty Lines

	Current	Projected
CONE Faculty	3	5
IE Faculty	3	4
TMGT Faculty	4	5
Total Faculty	10	14

Physical Resources

Office Space

The Department of Engineering & Technology has 11 offices, which houses the 10 full-time faculty and one full-time staff member. All of the offices are in the same wing of one building, which enables regular faculty/staff interaction. The office

space is functionally adequate and there is sufficient quantity for the current size staff. The department will require additional offices for every new faculty line.

The Department Head and secretary are housed in a department office suite, which is in the same building as the faculty/staff offices. The department office houses the copier and other office equipment, as well as the student files. The space is functionally adequate but will not accommodate any additional personnel, which will be required as the department grows.

Classrooms

A majority of the engineering and technology courses are taught in the department's two computer laboratories (28 and 23 capacity). For many of the courses, this space is adequate as the instruction integrates specialized engineering software. The department does not have a "traditional" classroom for sections that don't require computers and/or engineering software. In addition, courses with enrollments larger than 28 have to be moved to larger lecture halls within the building or an adjacent building. This limits when these courses can be offered as the department does not have priority to schedule rooms outside the department control.

Laboratories

In addition to the two computer laboratories/classrooms, the Department of Engineering & Technology has seven laboratories, which support the construction and industrial engineering programs. The laboratories include: 1) Construction Materials & Processes, 2) Hydrology, 3) Soils, 4) Strength of Materials, 5) Remote Construction Site, 6) Manufacturing & Automation, and 7) Systems Engineering. The laboratory space is functionally adequate and there is a sufficient quantity to support the current programs. New laboratory space will be required to support research initiatives for new faculty.

Appendix A
FACULTY CREDENTIAL FORMS

1. Date: October 11, 2012

2. Name: Pelin Altintas-Deleon **3. CWID:** **4. College:** ☐ **CBE** ☐ **COEHS** ☐ **CHSSA** ☒ **CoSEA**

5. Department: Engineering & Technology **6. Primary Teaching Discipline:** Industrial Engineering

7. Degrees Earned Information

Level	Type of Degree (PhD, EdD, etc.)	Discipline	Year Awarded	Institution Awarding Degree
7a. Doctorate Degree	**PhD**	**Systems & Engineering Management (Industrial Engineering)**	**2010**	**Texas Tech University**
7b. Master's Degree	**M.S.**	**Industrial Engineering**	**2003**	**Texas Tech University**
7c. Undergraduate Degree	**B.S.**	**Industrial Engineering**	**1998**	**Dokuz Eylul University, Turkey**
7d. Other				

8. Qualification Measure

Discipline Prefix or Specific Course Faculty is Qualified to Teach *(MATH, ENG, ART, PHYS 1401, etc.)*	Course Level *(Select one per line)*	Qualification: ***General education or baccalaureate courses:*** *Doctorate or master's degree in the teaching discipline or master's degree with a concentration in the teaching discipline (a minimum of 18 graduate semester hours in the teaching discipline).*	Qualification: ***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree in the teaching discipline or a related discipline*	Qualification: ***Graduate teaching assistants:*** *Master's in the teaching discipline or 18 graduate semester hours in the teaching discipline, direct supervision by a faculty member experienced in the teaching discipline*	Qualification: ***General education or baccalaureate courses:*** *Doctorate or master's degree outside teaching discipline with other qualifications.*	Qualification: ***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree outside teaching discipline with other qualifications.*
8a. IE	**x** UG ☐ Grad	**X**	☐	☐	☐	☐
8b. IT 340	**x** UG ☐ Grad	**X**	☐	☐	☐	☐
8c.	☐ UG ☐ Grad	☐	☐	☐	☐	☐
8d.	☐ UG ☐ Grad	☐	☐	☐	☐	☐

9. Name: Pelin Altintas-Deleon **10. CWID:**

11. Rank:
- ☐ **Professor**
- ☐ **Associate Professor**
- ☒ **Assistant Professor**
- ☐ **Instructor**
- ☐ **Clinical Faculty**
- ☐ **Adjunct**
- ☐ **TA**

12. Series:
- ☐ **Tenured**
- ☒ **Tenure Track**
- ☐ **Professional Track**
- ☐ **Not Applicable**

13. Graduate Faculty Status:
- ☐ **Graduate Faculty Member**
  (*Approved by the Graduate Council*)
- ☒ **Temporary Status**
- ☐ **Not a member the Graduate Faculty**

Complete the following sections only if faculty member does not hold a terminal degree in the teaching discipline

14. Undergraduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Master's and Doctorate degrees, majors, institutions)*

15. Graduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Doctorate/terminal degree, major, institution)*

16. Other Qualifications to Justify Instruction in Courses shown in Section, 8 and 14/15

Prefix or Course	Description Summary *(# Related graduate hours, related experiences, certifications/licenses, publications etc.)*

1. Date: October 12, 2012

2. Name: David Anderson **3. CWID:** **4. College:** ☐ CBE ☐ COEHS ☐ CHSSA ☒ CoSEA

5. Department: Engineering & Technology **6. Primary Teaching Discipline:** Technology Management

7. Degrees Earned Information

Level	Type of Degree (PhD, EdD, etc.)	Discipline	Year Awarded	Institution Awarding Degree
7a. Doctorate Degree	**PhD**	**Industrial Hygiene**	**1976**	**University of Oklahoma Health Sciences Center**
7b. Master's Degree	**M.S.**	**Environmental Health**	**1973**	**University of Oklahoma Health Sciences Center**
7c. Undergraduate Degree	**B.S.**	**Funeral Service Education Minor: Public Health**	**1970**	**University of Central Oklahoma (Formerly Central State College)**
7d. Other				

8. Qualification Measure

Discipline Prefix or Specific Course Faculty is Qualified to Teach *(MATH, ENG, ART, PHYS 1401, etc.)*	**Course Level** *(Select one per line)*	**Qualification**				
		General education or baccalaureate courses: *Doctorate or master's degree in the teaching discipline or master's degree with a concentration in the teaching discipline (a minimum of 18 graduate semester hours in the teaching discipline).*	***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree in the teaching discipline or a related discipline*	***Graduate teaching assistants:*** *Master's in the teaching discipline or 18 graduate semester hours in the teaching discipline, direct supervision by a faculty member experienced in the teaching discipline*	***General education or baccalaureate courses:*** *Doctorate or master's degree outside teaching discipline with other qualifications.*	***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree outside teaching discipline with other qualifications.*
8a. TMGT	**x** UG □ Grad	**X**	□	□	□	□
8b. IT	**x** UG **x** Grad	**X**	□	□	□	□
8c. SMGT	□ UG **x** Grad	□	**X**	□	□	□
8d. TMGT	□ UG **x** Grad	□	**X**	□	□	□

9. Name: David Anderson **10. CWID:**

11. Rank:
- ☐ **Professor**
- ☐ **Associate Professor**
- [x] **Assistant Professor**
- ☐ **Instructor**
- ☐ **Clinical Faculty**
- ☐ **Adjunct**
- ☐ **TA**

12. Series:
- ☐ **Tenured**
- [x] **Tenure Track**
- ☐ **Professional Track**
- ☐ **Not Applicable**

13. Graduate Faculty Status:
- [x] **Graduate Faculty Member** (***Approved by the Graduate Council***)
- ☐ **Temporary Status**
- ☐ **Not a member the Graduate Faculty**

Complete the following sections only if faculty member does not hold a terminal degree in the teaching discipline

14. Undergraduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Master's and Doctorate degrees, majors, institutions)*

15. Graduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Doctorate/terminal degree, major, institution)*

16. Other Qualifications to Justify Instruction in Courses shown in Section, 8 and 14/15

Prefix or Course	Description Summary *(# Related graduate hours, related experiences, certifications/licenses, publications etc.)*
IT TMGT	• 30 years of related industry experience in environmental, health, and safety management • Certified Industrial Hygienist • Certified Safety Professional • Qualified Environmental Professional • Certified Professional Environmental Auditor • President and CEO, Environmental Health Services, Inc. • Related scholarly publications and training materials

*Faculty is credentialed in the discipline by terminal degree. Items listed provide additional qualifications.

1. Date: October 12, 2012

2. Name: Jason Davis **3. CWID:** **4. College:** ☐ CBE ☐ COEHS ☐ CHSSA ☒ CoSEA

5. Department: Engineering & Technology **6. Primary Teaching Discipline:** Technology Management

7. Degrees Earned Information

Level	Type of Degree (PhD, EdD, etc.)	Discipline	Year Awarded	Institution Awarding Degree
7a. Doctorate Degree	**PhD**	**Education & Resource Studies – Technology of Industry**	**2002**	**Colorado State University**
7b. Master's Degree	**M.S.**	**Physics Minor: Industrial Technology**	**1993**	**Texas A&M University-Commerce**
7c. Undergraduate Degree	**B.S.**	**Physics Minor: Mathematics & Industrial Technology**	**1991**	**Texas A&M University-Commerce**
7d. Other				

8. Qualification Measure

Discipline Prefix or Specific Course Faculty is Qualified to Teach *(MATH, ENG, ART, PHYS 1401, etc.)*	Course Level *(Select one per line)*	Qualification: ***General education or baccalaureate courses:*** *Doctorate or master's degree in the teaching discipline or master's degree with a concentration in the teaching discipline (a minimum of 18 graduate semester hours in the teaching discipline).*	Qualification: ***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree in the teaching discipline or a related discipline*	Qualification: ***Graduate teaching assistants:*** *Master's in the teaching discipline or 18 graduate semester hours in the teaching discipline, direct supervision by a faculty member experienced in the teaching discipline*	Qualification: ***General education or baccalaureate courses:*** *Doctorate or master's degree outside teaching discipline with other qualifications.*	Qualification: ***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree outside teaching discipline with other qualifications.*
8a. TMGT	**x** UG □ Grad	**X**	□	□	□	□
8b. TMGT	□ UG **x** Grad	□	**X**	□	□	□
8c.	□ UG □ Grad	□	□	□	□	□
8d.	□ UG □ Grad	□	□	□	□	□

9. Name: Jason Davis **10. CWID:**

11. Rank:
- ☐ **Professor**
- x **Associate Professor**
- ☐ **Assistant Professor**
- ☐ **Instructor**
- ☐ **Clinical Faculty**
- ☐ **Adjunct**
- ☐ **TA**

12. Series:
- x **Tenured**
- ☐ **Tenure Track**
- ☐ **Professional Track**
- ☐ **Not Applicable**

13. Graduate Faculty Status:
- x **Graduate Faculty Member**
  (***Approved by the Graduate Council***)
- ☐ **Temporary Status**
- ☐ **Not a member the Graduate Faculty**

Complete the following sections only if faculty member does not hold a terminal degree in the teaching discipline

14. Undergraduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Master's and Doctorate degrees, majors, institutions)*

15. Graduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Doctorate/terminal degree, major, institution)*

16. Other Qualifications to Justify Instruction in Courses shown in Section, 8 and 14/15

Prefix or Course	Description Summary *(# Related graduate hours, related experiences, certifications/licenses, publications etc.)*

1. Date: December 13, 2012

2. Name: Wen-Hsing Liu **3. CWID:** **4. College:** ☐ CBE ☐ COEHS ☐ CHSSA ☒ CoSEA

5. Department: Engineering & Technology **6. Primary Teaching Discipline:** Industrial Engineering

7. Degrees Earned Information

Level	Type of Degree (PhD, EdD, etc.)	Discipline	Year Awarded	Institution Awarding Degree
7a. Doctorate Degree	**Ph.D.**	**Industrial Engineering**	**2012**	**Texas Tech University**
7b. Master's Degree	**M.S.**	**Industrial and Management Systems Engineering**	**2005**	**West Virginia University**
7c. Undergraduate Degree	**B.S.**	**Industrial Engineering**	**1998**	**Chung Yuan Christian University, Taiwan**
7d. Other				

8. Qualification Measure

Discipline Prefix or Specific Course Faculty is Qualified to Teach *(MATH, ENG, ART, PHYS 1401, etc.)*	Course Level *(Select one per line)*	Qualification: ***General education or baccalaureate courses:*** *Doctorate or master's degree in the teaching discipline or master's degree with a concentration in the teaching discipline (a minimum of 18 graduate semester hours in the teaching discipline).*	Qualification: ***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree in the teaching discipline or a related discipline*	Qualification: ***Graduate teaching assistants:*** *Master's in the teaching discipline or 18 graduate semester hours in the teaching discipline, direct supervision by a faculty member experienced in the teaching discipline*	Qualification: ***General education or baccalaureate courses:*** *Doctorate or master's degree outside teaching discipline with other qualifications.*	Qualification: ***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree outside teaching discipline with other qualifications.*
8a. IE	x UG ☐ Grad	X	☐	☐	☐	☐
8b. TMGT 352 (Cost Engr)	x UG ☐ Grad	X	☐	☐	☐	☐
8c.	☐ UG ☐ Grad	☐	☐	☐	☐	☐
8d.	☐ UG ☐ Grad	☐	☐	☐	☐	☐

9. Name: Wen-Hsing Liu **10. CWID:**

11. Rank:
- ☐ **Professor**
- ☐ **Associate Professor**
- **X Assistant Professor (Ad-Interim)**
- ☐ **Instructor**
- ☐ **Clinical Faculty**
- ☐ **Adjunct**
- ☐ **TA**

12. Series:
- ☐ **Tenured**
- ☐ **Tenure Track**
- ☐ **Professional Track**
- **X Not Applicable**

13. Graduate Faculty Status:
- ☐ **Graduate Faculty Member**
  (*Approved by the Graduate Council*)
- ☐ **Temporary Status**
- ☐ **Not a member the Graduate Faculty**

Complete the following sections only if faculty member does not hold a terminal degree in the teaching discipline

14. Undergraduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Master's and Doctorate degrees, majors, institutions)*

15. Graduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Doctorate/terminal degree, major, institution)*

16. Other Qualifications to Justify Instruction in Courses shown in Section, 8 and 14/15

Prefix or Course	Description Summary *(# Related graduate hours, related experiences, certifications/licenses, publications etc.)*

1. Date: October 12, 2012

2. Name: Perry Moler **3. CWID:** **4. College:** ☐ CBE ☐ COEHS ☐ CHSSA ☒ CoSEA

5. Department: Engineering & Technology **6. Primary Teaching Discipline:** Technology Management / Technology

7. Degrees Earned Information

Level	Type of Degree (PhD, EdD, etc.)	Discipline	Year Awarded	Institution Awarding Degree
7a. Doctorate Degree				
7b. Master's Degree	**M.S.**	**Technology Management**	**2010**	**Texas A&M University-Commerce**
7c. Undergraduate Degree	**B.S.**	**Technology Management**	**2005**	**Texas A&M University-Commerce**
7d. Other				

8. Qualification Measure

Discipline Prefix or Specific Course Faculty is Qualified to Teach *(MATH, ENG, ART, PHYS 1401, etc.)*	Course Level *(Select one per line)*	Qualification: ***General education or baccalaureate courses:*** *Doctorate or master's degree in the teaching discipline or master's degree with a concentration in the teaching discipline (a minimum of 18 graduate semester hours in the teaching discipline).*	Qualification: ***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree in the teaching discipline or a related discipline*	Qualification: ***Graduate teaching assistants:*** *Master's in the teaching discipline or 18 graduate semester hours in the teaching discipline, direct supervision by a faculty member experienced in the teaching discipline*	Qualification: ***General education or baccalaureate courses:*** *Doctorate or master's degree outside teaching discipline with other qualifications.*	Qualification: ***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree outside teaching discipline with other qualifications.*
8a. TMGT	**x** UG □ Grad	**X**	□	□	□	□
8b. IT	**x** UG □ Grad	**X**	□	□	□	□
8c.	□ UG □ Grad	□	□	□	□	□
8d.	□ UG □ Grad	□	□	□	□	□

9. Name: Perry Moler **10. CWID:**

11. Rank:
- ☐ **Professor**
- ☐ **Associate Professor**
- ☐ **Assistant Professor**
- [x] **Instructor**
- ☐ **Clinical Faculty**
- ☐ **Adjunct**
- ☐ **TA**

12. Series:
- ☐ **Tenured**
- ☐ **Tenure Track**
- ☐ **Professional Track**
- [x] **Not Applicable**

13. Graduate Faculty Status:
- ☐ **Graduate Faculty Member**
  (*Approved by the Graduate Council*)
- ☐ **Temporary Status**
- [x] **Not a member the Graduate Faculty**

Complete the following sections only if faculty member does not hold a terminal degree in the teaching discipline

14. Undergraduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Master's and Doctorate degrees, majors, institutions)*

15. Graduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Doctorate/terminal degree, major, institution)*

16. Other Qualifications to Justify Instruction in Courses shown in Section, 8 and 14/15

Prefix or Course	Description Summary *(# Related graduate hours, related experiences, certifications/licenses, publications etc.)*

1. Date: October 11, 2012

2. Name: Nilo Tsung **3. CWID:** **4. College:** ☐ **CBE** ☐ **COEHS** ☐ **CHSSA** ☒ **CoSEA**

5. Department: Engineering & Technology **6. Primary Teaching Discipline:** Construction Engineering / Construction Management

7. Degrees Earned Information

Level	Type of Degree (PhD, EdD, etc.)	Discipline	Year Awarded	Institution Awarding Degree
7a. Doctorate Degree	**Ph.D.**	**Civil Engineering**	**2010**	**University of Colorado, Boulder**
7b. Master's Degree	**M.S.**	**Civil Engineering**	**1984**	**University of Colorado, Boulder**
7c. Undergraduate Degree	**B.S.**	**Construction Engineering**	**1980**	**National Taiwan Institute of Technology**
7d. Other	**M.S.**	**Computer Science**	**1999**	**University of Colorado, Boulder**

8. Qualification Measure

		Qualification				
Discipline Prefix or Specific Course Faculty is Qualified to Teach *(MATH, ENG, ART, PHYS 1401, etc.)*	**Course Level** *(Select one per line)*	***General education or baccalaureate courses:*** *Doctorate or master's degree in the teaching discipline or master's degree with a concentration in the teaching discipline (a minimum of 18 graduate semester hours in the teaching discipline).*	***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree in the teaching discipline or a related discipline*	***Graduate teaching assistants:*** *Master's in the teaching discipline or 18 graduate semester hours in the teaching discipline, direct supervision by a faculty member experienced in the teaching discipline*	***General education or baccalaureate courses:*** *Doctorate or master's degree outside teaching discipline with other qualifications.*	***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree outside teaching discipline with other qualifications.*
8a. CONE	**x** UG □ Grad	**X**	□	□	□	□
8b. TMGT 335[1]	**x** UG □ Grad	**X**	□	□	□	□
8c. TMGT 336[2]	**x** UG □ Grad	**X**	□	□	□	□
8d. TMGT 439[3]	**x** UG □ Grad	**X**	□	□	□	□
8e. TMGT 454[4]	**x** UG □ Grad	**X**	□	□	□	□

[1]TMGT 335, Construction & LEED Systems (Construction Management)

[2]TMGT 336, Construction Cost Estimating (Construction Management)

[3]TMGT 439, Construction Management (Construction Management)

[4]TMGT 454, Contracts & Specifications (Construction Management)

[5]IE 201, Elementary Engineering Analysis (General Engineering)

9. Name: Nilo Tsung **10. CWID:**

11. Rank:
- ☐ **Professor**
- ☐ **Associate Professor**
- ☒ **Assistant Professor**
- ☐ **Instructor**
- ☐ **Clinical Faculty**
- ☐ **Adjunct**
- ☐ **TA**

12. Series:
- ☐ **Tenured**
- ☒ **Tenure Track**
- ☐ **Professional Track**
- ☐ **Not Applicable**

13. Graduate Faculty Status:
- ☐ **Graduate Faculty Member**
  (*Approved by the Graduate Council*)
- ☐ **Temporary Status**
- ☒ **Not a member the Graduate Faculty**

Complete the following sections only if faculty member does not hold a terminal degree in the teaching discipline

14. Undergraduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Master's and Doctorate degrees, majors, institutions)*

15. Graduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Doctorate/terminal degree, major, institution)*

16. Other Qualifications to Justify Instruction in Courses shown in Section, 8 and 14/15

Prefix or Course	Description Summary *(# Related graduate hours, related experiences, certifications/licenses, publications etc.)*

1. Date: October 12, 2012

2. Name: Gregory Wilson **3. CWID:** **4. College:** ☐ CBE ☐ COEHS ☐ CHSSA ☒ CoSEA

5. Department: Engineering & Technology **6. Primary Teaching Discipline:** Construction Engineering / Construction Management

7. Degrees Earned Information

Level	Type of Degree (PhD, EdD, etc.)	Discipline	Year Awarded	Institution Awarding Degree
7a. Doctorate Degree	**PhD**	**Civil Engineering**	**1992**	**Arizona State University**
7b. Master's Degree	**M.S.**	**Civil Engineering**	**1982**	**Arizona State University**
7c. Undergraduate Degree	**B.S.**	**Construction Management**	**1972**	**Arizona State University**
7d. Other				

8. Qualification Measure		**Qualification**				
Discipline Prefix or Specific Course Faculty is Qualified to Teach *(MATH, ENG, ART, PHYS 1401, etc.)*	**Course Level** *(Select one per line)*	***General education or baccalaureate courses:*** *Doctorate or master's degree in the teaching discipline or master's degree with a concentration in the teaching discipline (a minimum of 18 graduate semester hours in the teaching discipline).*	***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree in the teaching discipline or a related discipline*	***Graduate teaching assistants:*** *Master's in the teaching discipline or 18 graduate semester hours in the teaching discipline, direct supervision by a faculty member experienced in the teaching discipline*	***General education or baccalaureate courses:*** *Doctorate or master's degree outside teaching discipline with other qualifications.*	***Graduate and post-baccalaureate courses:*** *Earned doctorate/terminal degree outside teaching discipline with other qualifications.*
8a. CONE	**x** UG □ Grad	**X**	□	□	□	□
8b. TMGT 335[1]	**x** UG □ Grad	**X**	□	□	□	□
8c. TMGT 336[2]	**x** UG □ Grad	**X**	□	□	□	□
8d. TMGT 439[3]	**x** UG □ Grad	**X**	□	□	□	□
8e. TMGT 454[4]	**x** UG □ Grad	**X**	□	□	□	□

[1]**TMGT 335, Construction & LEED Systems (Construction Management)**

[2]**TMGT 336, Construction Cost Estimating (Construction Management)**

[3]**TMGT 439, Construction Management (Construction Management)**

[4]**TMGT 454, Contracts & Specifications (Construction Management)**

9. Name: Gregory Wilson **10. CWID:**

11. Rank:
- ☐ **Professor**
- ☐ **Associate Professor**
- x **Assistant Professor**
- ☐ **Instructor**
- ☐ **Clinical Faculty**
- ☐ **Adjunct**
- ☐ **TA**

12. Series:
- ☐ **Tenured**
- ☐ **Tenure Track**
- x **Professional Track**
- ☐ **Not Applicable**

13. Graduate Faculty Status:
- x **Graduate Faculty Member (*Approved by the Graduate Council*)**
- ☐ **Temporary Status**
- ☐ **Not a member the Graduate Faculty**

Complete the following sections only if faculty member does not hold a terminal degree in the teaching discipline

14. Undergraduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Master's and Doctorate degrees, majors, institutions)*

15. Graduate Courses – Related Degree(s)

Prefix or Course	Academic Degree(s) *(Doctorate/terminal degree, major, institution)*

16. Other Qualifications to Justify Instruction in Courses shown in Section, 8 and 14/15

Prefix or Course	Description Summary *(# Related graduate hours, related experiences, certifications/licenses, publications etc.)*