WICHITA STATE UNIVERSITY

[redacted]

Academic unit: Mechanical Engineering

College: Engineering

Date of last review

[redacted]

[redacted]

12

6

[redacted]

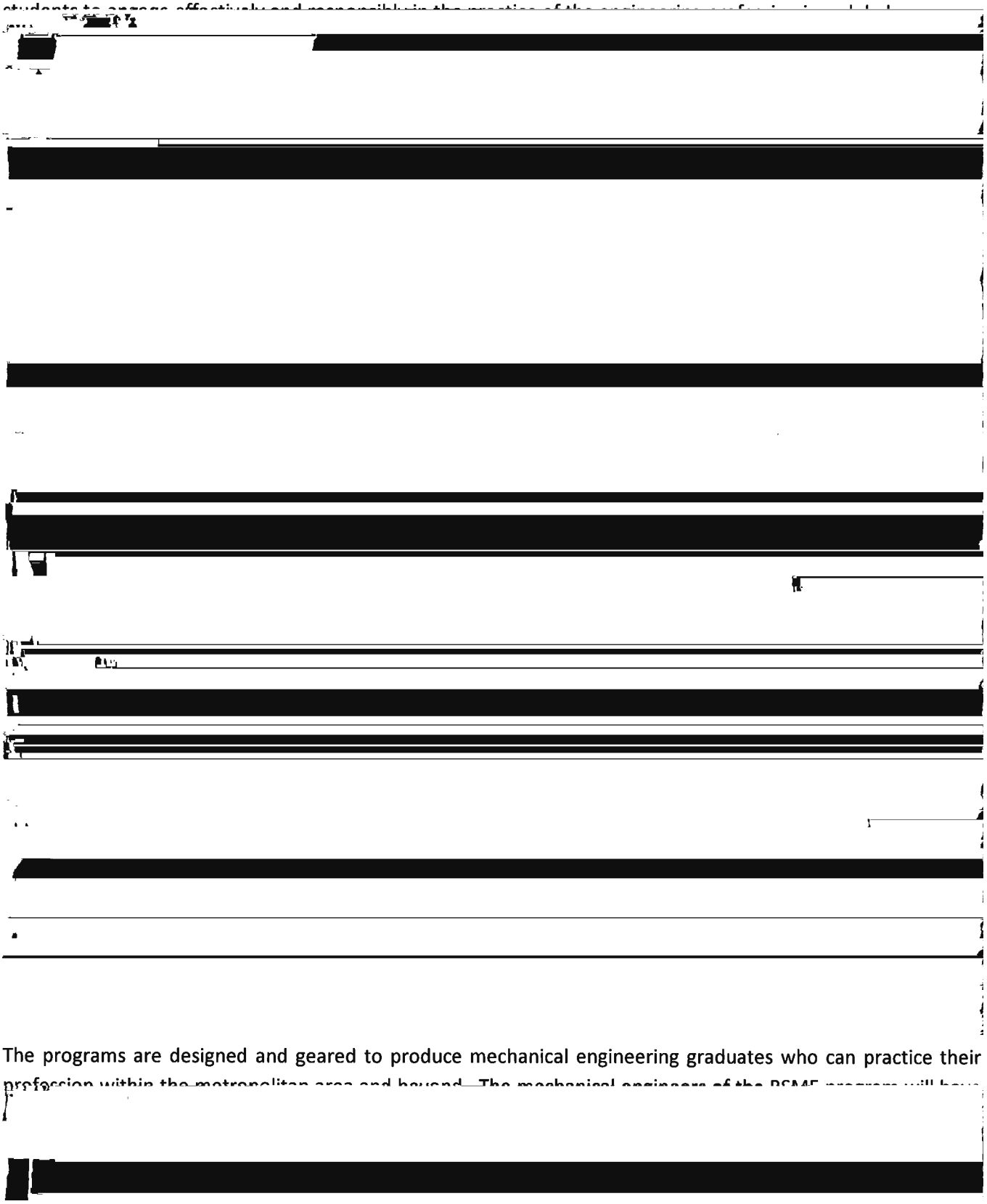
1. Departmental purpose and relationship to the University mission (refer to instructions in the WSU

a. University Mission:

Wichita State University is committed to providing comprehensive educational opportunities in an urban setting. Through teaching, scholarship and public service the University seeks to equip both students and

the larger community with the educational and cultural tools they need to thrive in a complex world, and

The role and missions of the Mechanical Engineering programs are consistent and in line with those of the College of Engineering and the University's broad mission. These include preparing undergraduate and graduate students to engage effectively and responsibly in the practice of the engineering profession [redacted]

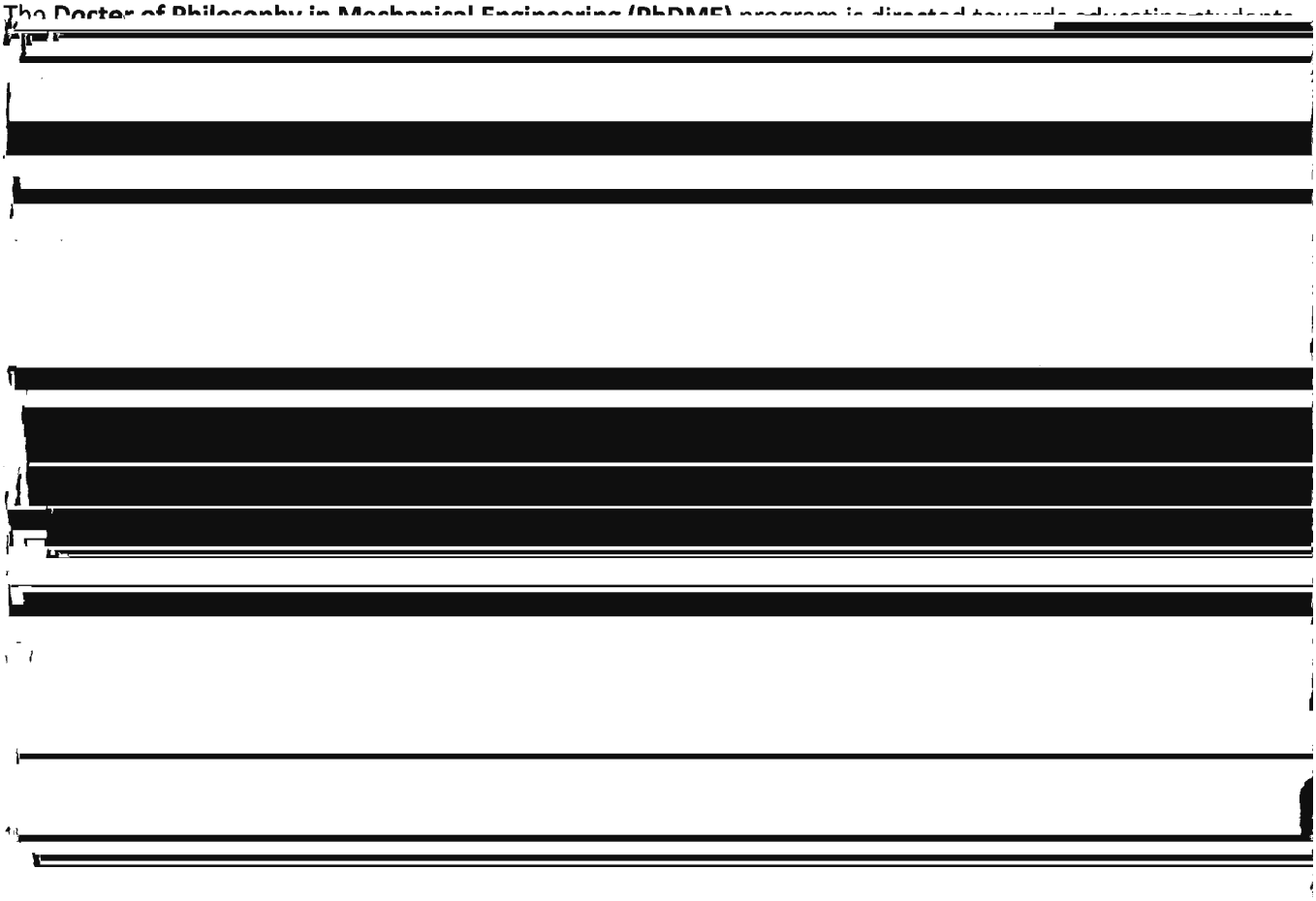


The programs are designed and geared to produce mechanical engineering graduates who can practice their profession within the metropolitan area and beyond. The mechanical engineers of the BSME program will have [redacted]

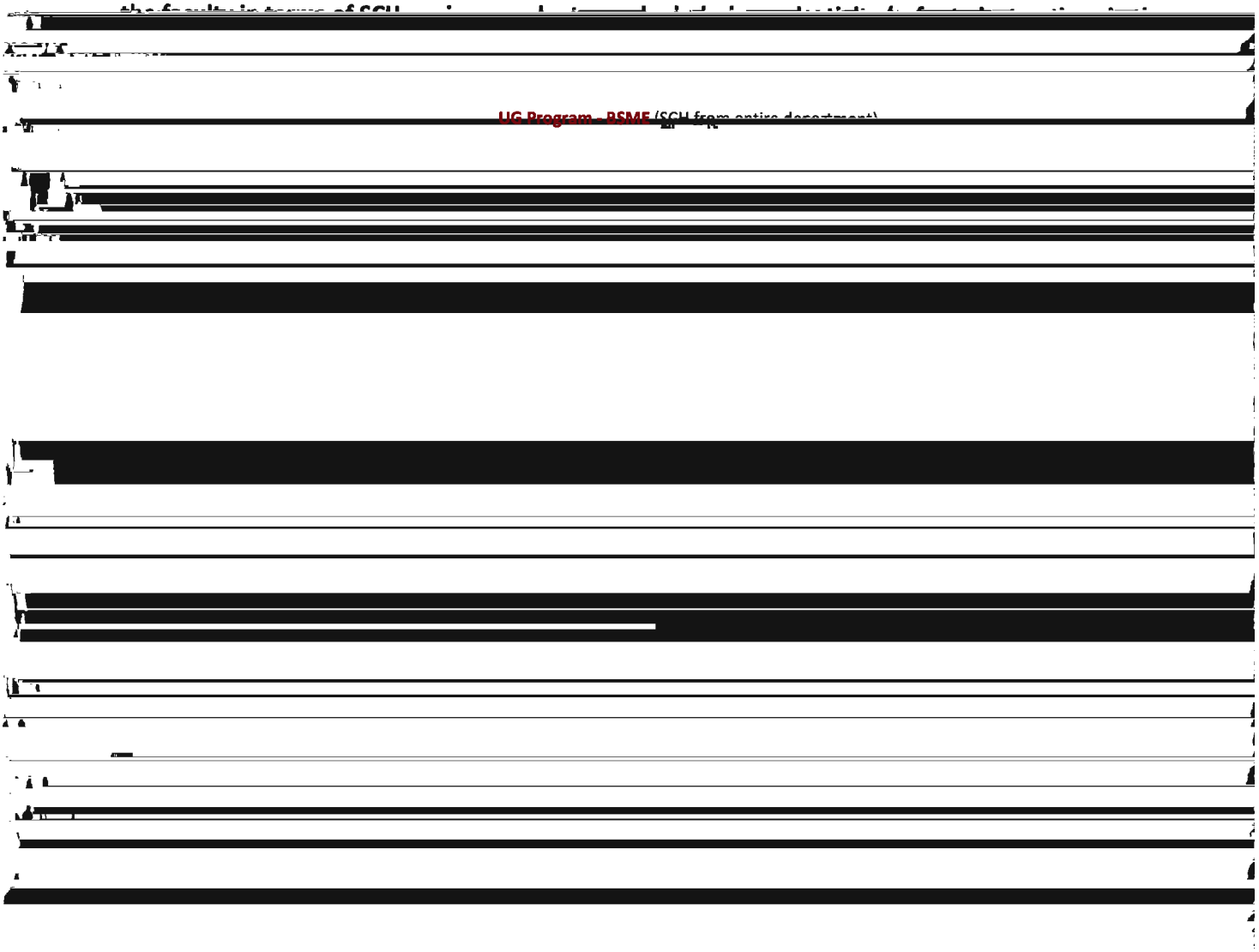
2. Ensure that graduates have the technical knowledge and academic background necessary to be accepted to other advanced degree program, such as a doctoral of philosophy in mechanical engineering.

The Master program (MSME) is assessed through a set of learner outcomes related to competency in core areas, design skills, effective communication, engineering ethics, and ability to self-educate. The course work evaluation, course project effectiveness, and thesis/project work are all part of this assessment. Program effectiveness is gauged by the papers presented by the students at regional and national conferences, including annual graduate school GRASP presentation. The details of the MSME program assessment is provided in Appendix B.

The **Doctor of Philosophy in Mechanical Engineering (PhDME)** program is directed towards educating students



2a. Describe the quality of the program as assessed by the strengths, productivity, and qualifications of



WSU Program Review document for more information on completing this section). Complete a separate table for each program if appropriate.

Last 3 Years	Tenure/Tenure Track Faculty (Number)	Tenure/Tenure Track Faculty with Terminal Degree (Number)	Instructional FTE (#): TTF= Tenure/Tenure Track GTA=Grad teaching assist O=Other instructional FTE			Total SCH - Total SCH by FY from Su, Fl, Sp	Total Majors - From fall semester	Total Grads by FY
			TTF	GTA	O			
Year 1→								
Year 2→								
Year 3→								
						SCH/ FTE	Majors/ FTE	Grads/ FTE
		Total Number Instructional (FTE) – TTF+GTA+O ↓						
Year 1→								
Year 2→								
Year 3→								

in the number of tenured and tenure-track faculty from 11 to 7 during that same period, the department has

maintained effective teaching and instruction. The teaching laboratories have been expanded and new lab

safety measures have been implemented. More emphasis has also been placed on the experience–based learning and engagement of the students with the mechanical design and development process. The ME faculty

2h. Describe the quality of the program as assessed by the strengths, productivity, and qualifications of

MS-ME Program

*	*	*	*	*	N/A	84	25
*	*	*	*	*	N/A	93	18
*	*	*	*	*			

N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

the faculty in terms of SCH, majors, graduates and scholarly productivity (refer to instructions in the WSU Program Review document for more information on completing this section). Complete a separate table for each program if appropriate.

9	3	29	5	7	2	1	10	$2,712,979
17	13	33	11	21	5	1	7	$1,380,293
35	18	45	18	37	3	2	16	$2,526,433

Last 3 Years

*From the table on page 3, indicate number of faculty (and instructional FTE) teaching in the graduate program.

	Tenure/Tenure Track Faculty (Number)	Tenure/Tenure Track Faculty with Terminal Degree (Number)	Instructional FTE (#): TTF= Tenure/Tenure Track GTA=Grad teaching assist O=Other instructional FTE			Total SCH - Total SCH by FY from Su, Fl, Sp	Total Majors - From fall semester	Total Grads by FY
			TTF	GTA	O			
Year 1→								
Year 2→								
Year 3→								

3a. Describe the quality of the program as assessed by the student evaluations and [illegible]

PhD-ME Program

							N/A	19	2
							N/A	20	3
							N/A	N/A	N/A	N/A
							N/A	N/A	N/A	N/A
							N/A	N/A	N/A	N/A
9	3	29	5	7	2	1	10	$2,712,979
17	13	33	11	21	5	1	7	$1,380,293
35	18	45	18	37	3	2	16	$2,526,433

the faculty in terms of SCU, majors, graduates and scholarly productivity

in a collection. KBOR data minima for UG programs: Majors=25; Graduates=10; Faculty=2; KBOR data minima for master programs: Majors=20; Graduates=5

3b. From the table on page 3, indicate number of faculty (and instructional FTE) teaching in the graduate program.

3. Academic Program: Analyze the quality of the program as assessed by its curriculum and impact on students. Complete this section for each program (if more than one). Attach updated program assessment plan (s) as an

227	22.7	22.66	
249	22.8	22.72	
		22.81	

appendix (refer to instructions in the WSU Program Review document for more information).

95	17	3.54	3.33	3.33	3.51	3.48	3.62
85	18	3.41	3.43	3.36	3.57	3.48	3.62
59	18	3.42	3.68	3.40	3.60	3.48	3.67

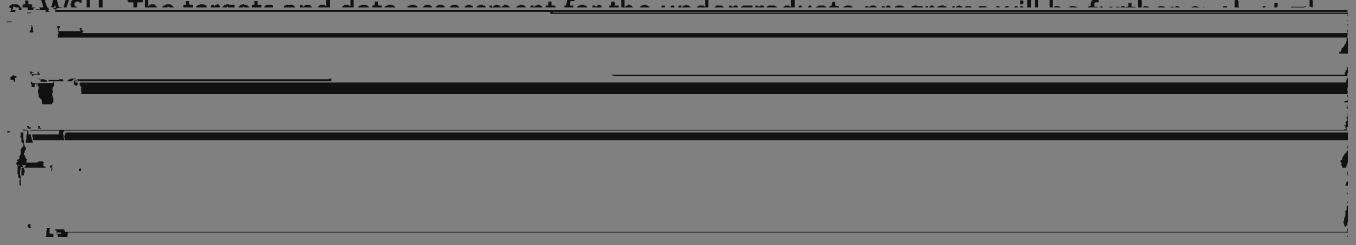
a. For undergraduate programs, compare ACT scores of the majors with the University as a whole.

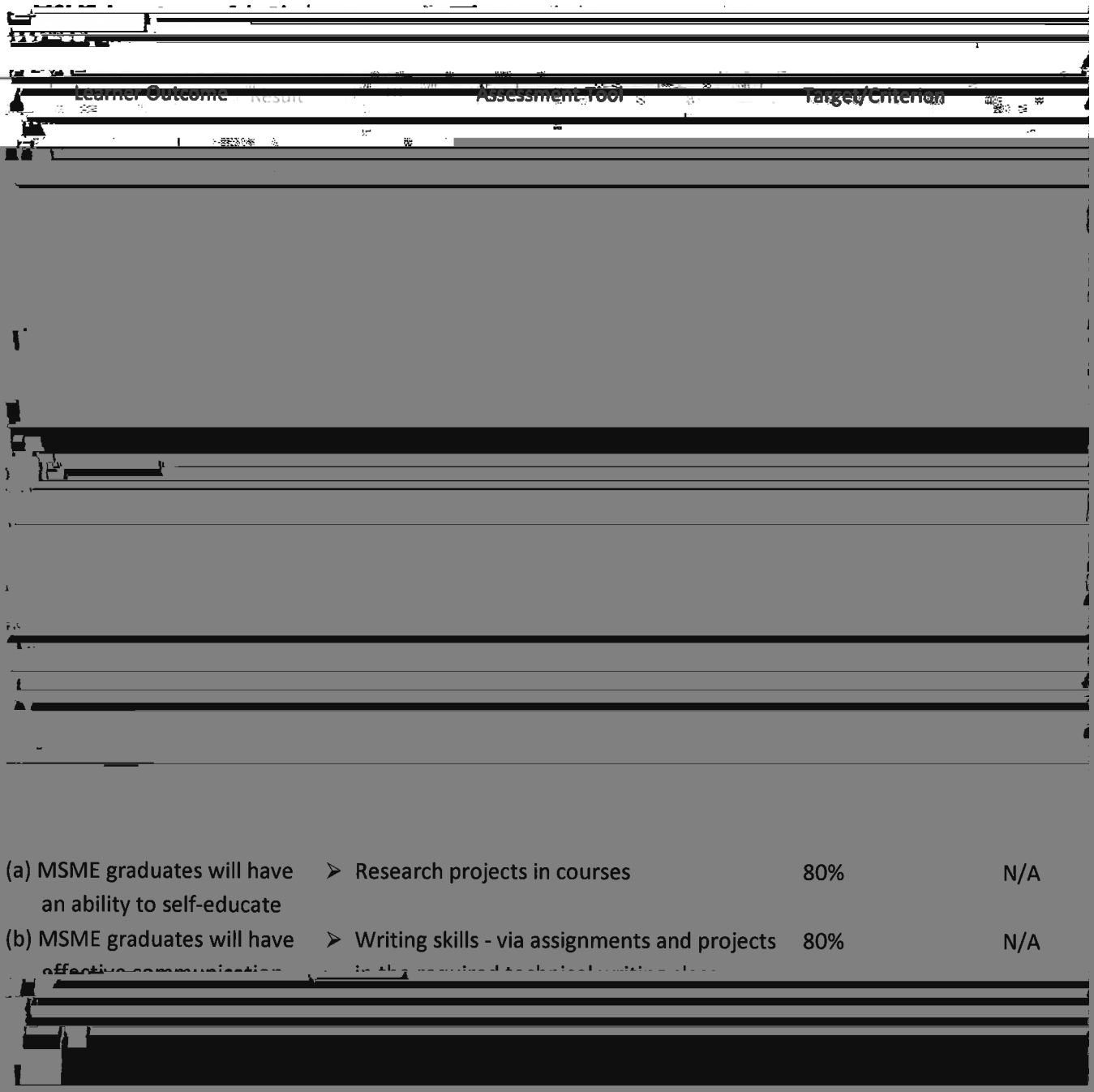
Last 3 Years	Total Majors - From fall semester	ACT – Fall Semester (mean for those reporting)	
		Majors	All University Students - FT
Year 1→			
Year 2→			
Year 3→			

BSME Assessment Criteria (see **Appendix A** for Detailed Assessment Plan)

Learner Outcome	Assessment Tool	Target/Criterion	
BSME graduates will attain:	➢ ME Senior Exit Exam	33% (50%)*	50.4%
(a) An ability to apply knowledge of mathematics, science, and engineering.	➢ ME Senior Exit Survey, Amount of Learning	3.0/5.0	3.68/5.0
BSME graduates will attain:	➢ Capstone Industry Project Score	80%	95.2%
(b) An ability to design and conduct experiments, as well as to analyze and interpret data.			
BSME graduates will attain:	➢ Capstone Industry Project Score	85%	95.2%
(c) An ability to design a system, component, or process to meet desired needs.	➢ Capstone Design: Industry Project Qualitative Feedback	100% Positive Feedback	100%
BSME graduates will attain:	➢ Capstone Design: Team Member Peer Evaluation	85%	98.4%

* The first number corresponds to the average passing score from the University of Oklahoma simulated on-line FE Exams. The second number in parentheses is the target set by the BSME program at WSU. The targets and data assessment for the undergraduate programs will be further [illegible]





Learner Outcome	Result	Assessment Tool	Target Criterion
(a) MSME graduates will have an ability to self-educate		➢ Research projects in courses	80%	N/A
(b) MSME graduates will have effective communication		➢ Writing skills - via assignments and projects in the required technical writing class	80%	N/A

PhD Assessment Criteria (see **Appendix C** for Detailed Assessment Plan)

Learner Outcome	Assessment Tool	Target/Criterion	
(a) PhDME graduates will have an ability to self-educate [redacted] and to conduct independent scholarly research.	➢ Rubric score on dissertation ➢ Research projects in courses	80%	N/A
(b) PhDME graduates will have effective oral and written communication skills [redacted]	➢ Writing skills via assignments and projects in writing class CESP750D; graduate level courses that have writing component; and dissertation	80%	N/A

d. Provide aggregate data on student majors satisfaction (e.g., exit surveys), capstone results, licensing or

[redacted]

Capstone 47.1%
Capstone 47.7%
Capstone 50.4% 33%

[redacted]

3.66 3.55 3.07 3.02

3.68 3.55 3.13 3.12

with the program and whether students are learning the curriculum (for learner outcomes, data should relate to the goals and objectives of the program as listed in 1a)

[redacted]

Student Satisfaction (e.g., exit survey data on overall program satisfaction).* If available, report by year, for the last 3 years			Learner Outcomes (e.g., capstone, licensing/certification exam pass-rates) by year, for the last three years				
Year	N	Result (e.g., 4.5 on scale of 1-5, where 5 highest)	Year	N	Name of Exam	Program Result	National Comparison±
1 (2009)		Senior Exit Survey on ME Curriculum (see Table below)	1 (2009)				N/A
2 (2010)		Senior Exit Survey on ME Curriculum (see Table below)	2 (2010)				N/A
3 (2011)		Senior Exit Survey on ME Curriculum (see Table below)	3 (2011)				

Publications with Graduate Students	2009	2010	2011
Graduate Student Co-Authored Journal Publications	8	17	33
Graduate Student Co-Authored Conference	27	33	44

[redacted]

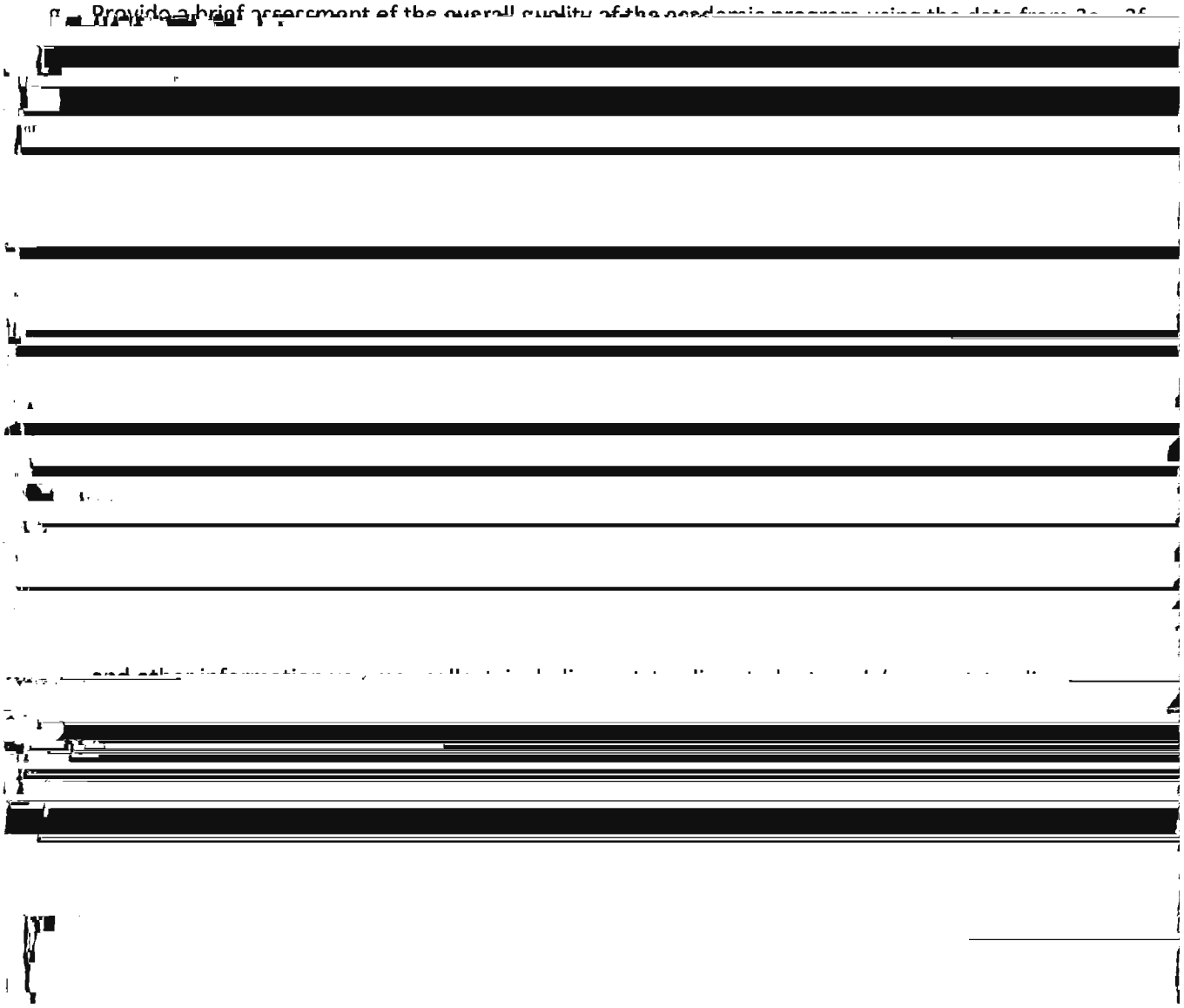
Foundation Skills are assessed in undergraduate programs (optional for graduate programs).

Goals/Skills Measurements of:	Results	
	Majors	Non-Majors
-Oral and written communication		
-Numerical literacy		
-Critical thinking and problem solving		
-Collaboration and teamwork		
-Library research skills		

[redacted]

f. Indicate whether the program is accredited by a specialty accrediting body including the next review date and concerns from the last review.

The Bachelor of Science in Mechanical Engineering program is accredited by ABET. At the time of last review in Fall 2007, no concern was indicated by the accreditation agency.



4a. Analyze the student need and employer demand for the program. Complete for each program if appropriate.

Utilize the table below to provide data that demonstrates student need and demand for the program.

Undergraduate - BSME

86	47	54.7%	59	$62,500	
70	36	51.4%	62	$57,500	
73	[redacted]	60.3%			

(refer to instructions in the WSU Program Review document for more information on completing this section).

37	3	1	43	2	0	129	0	12	11	2	0	6	0	0	38	0	2
36	5	2	58	2	0	131	0	15	10	0	0	18	0	0	29	0	5

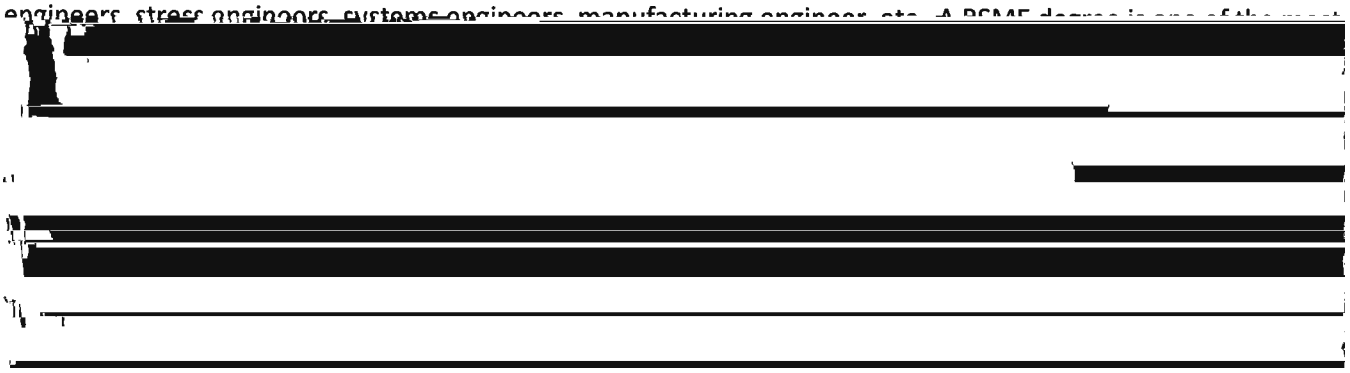
a

Majors Employment of Majors*

* Go to the U.S. Bureau of Labor Statistics Website: http://www.bls.gov/oco/ and view job outlook data and salary information (if the Program has information available from professional associations or alumni surveys, enter that data).

Last 3 FYs	No. new appli	No. who	No. enroll	1 Year Attri	Total # of	Average Starting	Employ-ment	Employment % in the field	Employment:	Employment:	No.	Projected

Graduates of the BS program in Mechanical Engineering typically find jobs as mechanical engineers, design engineers, stress engineers, systems engineers, manufacturing engineer, etc. A BSME degree is one of the most



4b. Analyze the student need and employer demand for the program. Complete for each program if appropriate (refer to instructions in the WSU Program Review document for more information on completing this section).

a Utilize the table below to provide data that demonstrates student need and demand for the program.

Graduate - MSME

	Majors					Employment of Majors*						
Last 3 FYs –	No. new appli-	No. who	No. enroll-	1 Year Attri-	Total no. of	Average Salary	Employ-ment	Employment % in the field	Employment: % related to	Employment: % outside the	No. pursuing	Projected growth
		46	38	82.6%	25							
		46	35	76.1%	18							
		27	22	81.5%								

	55	1	0	6	1	0	17	0	4	14	0	0	3	1	0	6	0	1		
	51	2	0	9	0	0	29	0	2	13	0	0	0	0	0	5	0	0		

and Sp	declared majors	are admit-ted in the major	year later														or profes-sional educa-tion	BLS**	
Year 1→																			Current year only
Year 2→																			
Year 3→																			

** Go to the U.S. Bureau of Labor Statistics Website: http://www.bls.gov/oco/ and view job outlook data and salary information (if the Program has information available from professional associations or alumni surveys, enter that data)

*** NRA=Non-resident alien; H=Hispanic; AI/AN=American Indian/ Alaskan Native; A=Asian; B=Black; NH/PI=Native Hawaiian/Pacific Islander; C=Caucasian; MR=Multi-race; UNK=Unknown

KPQP data minima for UG programs: Majors=25, Graduates=10, Faculty=3, KPQP data is updated once a year

	Race/Ethnicity by Major***										Race/Ethnicity by Graduate***									
	NRA	H	AI/AN	A	B	NH/PI	C	MR	UNK		NRA	H	AI/AN	A	B	NH/PI	C	MR	UNK	

Graduate – PhD

12	8	66.7%	2
8	7	87.5%	3
8	6	75.0%	

(refer to instructions in the WSU Program Review document for more information on completing this section).

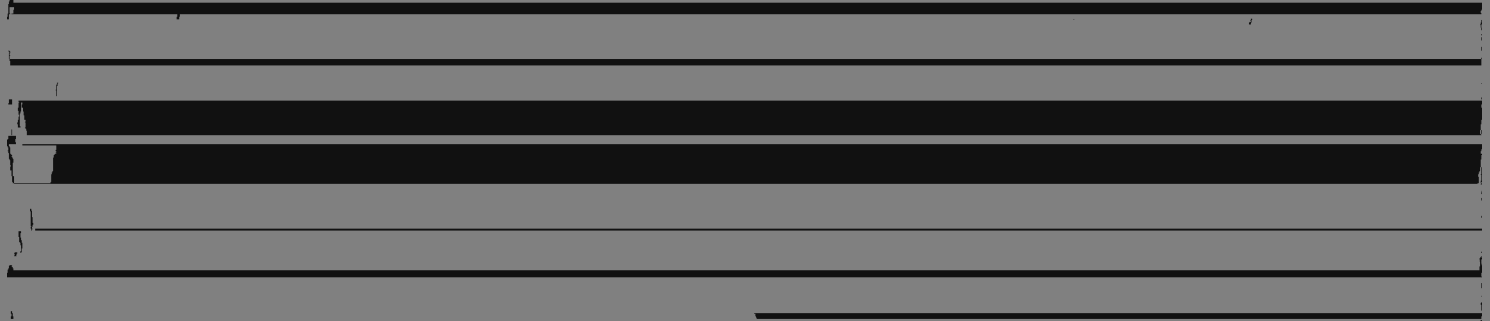
14	0	1	1	1	0	1	0		2	0	0	0	0	0	0	0	0			
16	Majors	0	0	0	3	0	0	1	0	Employment of Majors*										

Last 3 No new No No 1 Year Total Average Employ- Employment Employment Employment No Projected

* May not be collected every year

Go to the U.S. Bureau of Labor Statistics Website: http://www.bls.gov/oco/ and view job outlook data and salary information (if the Program has information available from professional associations or alumni surveys, enter that data)

FYs – appli- who enroll- Attri- no. of Salary ment % in the field %-related to %-outside the



5 Analyze the cost of the program and service the Program provides to the disciplines, other programs at the

54.6 60.8

18.2 17.4

27.2 21.9

6. **Report on the Program's goal (s) from the last review. List the goal (s), data that may have been collected to**

[redacted]

Program Review document for more information on completing this section).

(For Last 3 FYs) Assessment Data Analyzed

[redacted]

Opportunities:

1. [redacted]

See a we

Senate Bill #127.

2. With the improvements in the economy of the State and nation, the demand for mechanical [redacted]

Appendix A

Detailed Assessment Plan for BS in Mechanical Engineering Program

I. Mission

The mission of the Bachelor of Science in Mechanical Engineering (BSME) program at Wichita State University is

IV. Assessment of (Student) Learner Outcomes

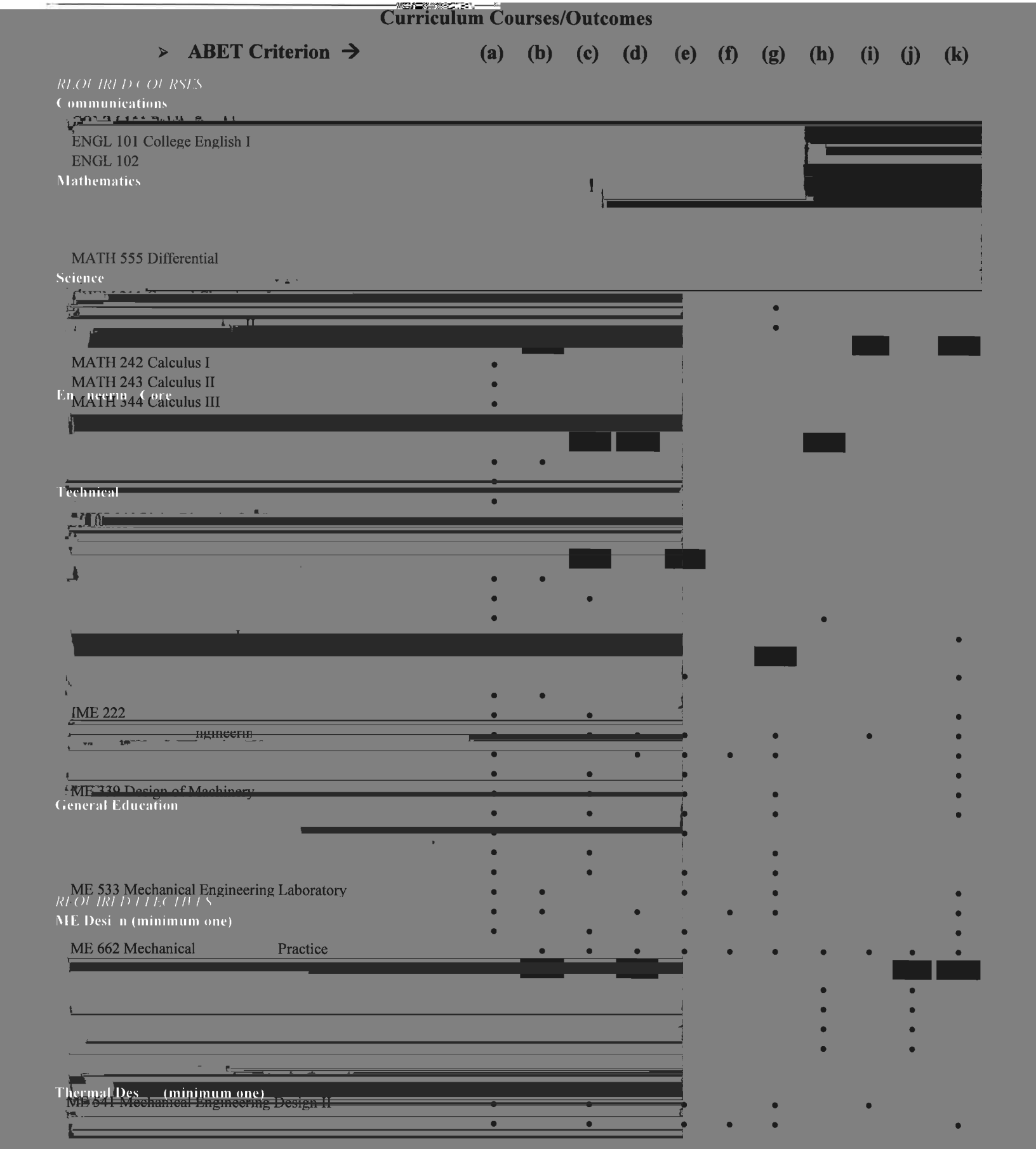
[redacted]

development of the assessment process is shown in Figure A.1. All courses at the undergraduate level have a syllabus that identifies the learner outcomes for the course. However, not all learner outcomes are reported to the assessment team. These learning outcomes are collected by the faculty teaching the course each semester. In addition, the department has mapped specific learning outcomes to be reported to the [redacted]

Students who complete the ME program will do the following:

PROGRAM EDUCATIONAL OBJECTIVES * (relating ABET Outcomes and Assesment Tools) →	ngineering	s	s	ial issues	temporary issues
PEO 1, 3					
PEO 1, 2					
PEO 1, 3					
PEO 1, 3					
PEO 1, 2					
PEO 1, 3					
PEO 1, 3					
PEO 1, 3					
PEO 1, 2					
PEO 1, 2					
PEO 1, 2					

Table A.3 Relationship of Curriculum and Program Outcomes



Curriculum Courses/Outcomes

➢ ABET Criterion →	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
ME 631 Heat	[redacted]		•		•	•	•		•	•	•
ME 450 Selected Topics—Creative Design and Practice			•					•	•	•	•
ME 664 Introduction to Fatigue and Fracture	•		•		•		•				•
ME 665 Selection of Materials for Design/ Manufacturing	•		•		•		•				•
ME 667 Mechanical Properties of Materials I	•		•		•		•				•
ME 669 Acoustics	•		•		•		•				•
ME 719 Basic Combustion Theory	•				•		•				•
ME 760 Fracture Mechanics	•		•		•			•			•
ME 762 Polymeric Composite Materials	•		•		•		•				•

Table A.4 Assessment of Learner Outcomes for the BSME Program

Learner Outcome	Assessment Tool	Target/Crit	
BSME graduates will attain:	➢ ME Senior Exit Exam	33% (50	50.4%
(a) An ability to apply knowledge of mathematics, science, and engineering.	➢ ME Senior Exit Survey, Amount of Learning	3.0/5.0	3.68/5.0
BSME graduates will attain:	➢ Capstone Industry Project Score	80%	95.2%
[redacted] conduct experiments, as well as to analyze and interpret [redacted]			
BSME graduates will attain:	➢ Capstone Industry Project Score	85%	95.2%
(c) An ability to design a system	➢ Capstone Design: Industry Project Qualitative	100% Positive	100%
[redacted]			

[redacted]

(i) A recognition of the need for, and an ability to engage in, life- learnin

[redacted]

How

(j) A knowledge of contemporary issues

How often is it closed?

[redacted]

Appendix B

[redacted]

I. Mission

The mission of the Master of Science in Mechanical Engineering (MSME) program is to provide the graduate [redacted]

[redacted]

students to the process of research through course work, to train students in comprehensive research through

- The writing skills will be assessed through assignments and projects in the required technical writing class CESP750D, and graduate level courses that have writing and presentation components.

(c) Graduates will have competency in one of the following areas:

Learner Outcome

- Materials Engineering,
- Thermo-Fluid Sciences,

Assessment Tool

- Graduates will be assessed while taking the core classes in materials engineering, thermo-fluid sciences, and mechanical systems and design.

(d) Graduates will be able to design and improve systems, components, or processes to meet desired needs:

- Graduates will be assessed while taking classes which emphasize design and improvement of

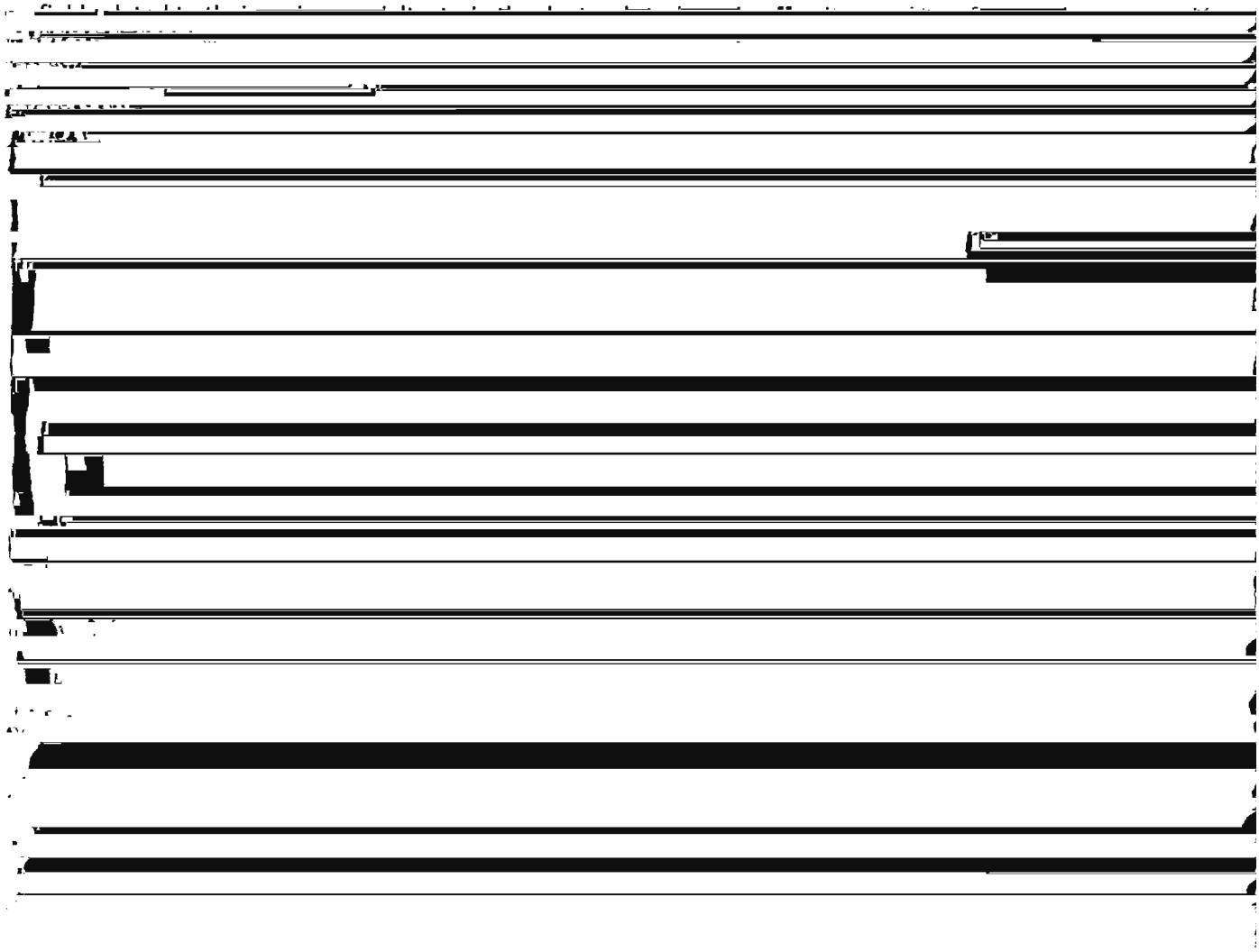
(e) MSME graduates will have a knowledge of professional and ethical responsibility.	➢ Graduate students will be assessed using [redacted] reported.	80%	N/A

Appendix C

Detailed Assessment Plan for PhD in Mechanical Engineering

I. Mission

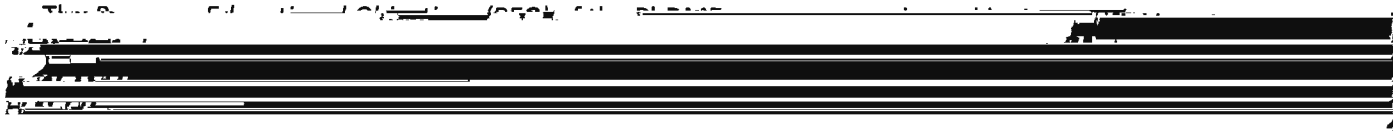
The mission of the Doctor of Philosophy (PhDME) program is to educate and train graduate students in a subspecialty major of mechanical engineering, broaden the knowledge base of the doctoral students in a minor



team of peers, train the students in presentation skills through research paper presentation and publication, and prepare the doctoral graduates to serve the global community in research and/or education.

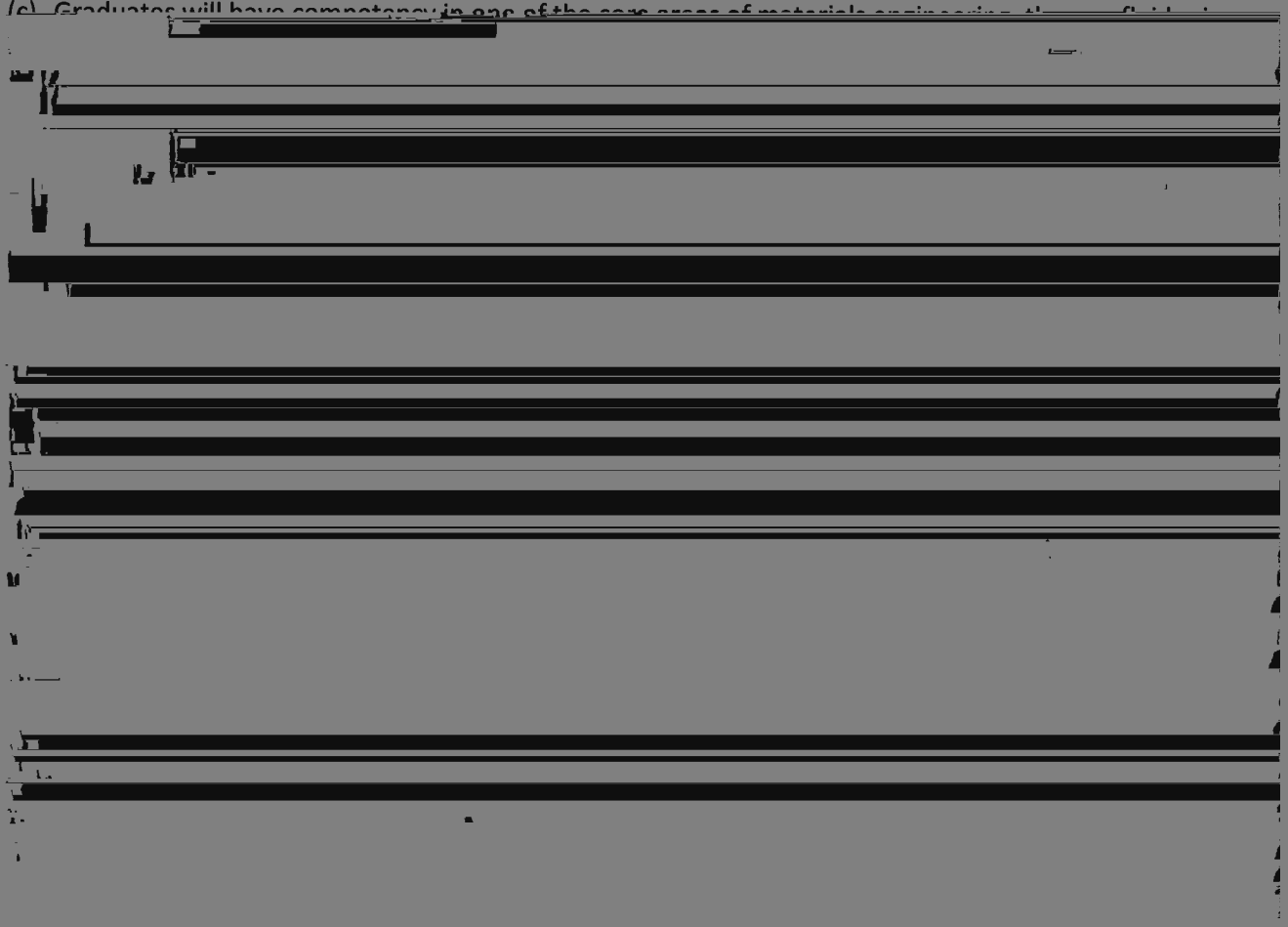
The mission is in support of the College of Engineering as well as that of the University in teaching, scholarship and service. The constituents of the Mechanical Engineering Graduate program are its graduate students and faculty.

II. Program Objectives



addition, students will be evaluated at the time of the dissertation defense for their writing and presentation skills

(c) Graduates will have competency in one of the core areas of materials engineering, thermal fluid



mechanical systems and design, as well as their major and minor areas:

- Graduates will be assessed via taking PhD qualifying, major and minor exams.

(d) Graduates will be able to design and improve systems, components, or processes to meet desired needs:

	concepts developed in the core classes.		
(d) PhDME graduates will be able to design and improve systems, components, or processes to meet desired needs.	➢ Graduates will be assessed for course learner outcomes while taking classes which emphasize design and improvement of engineering systems.	80%	N/A
(e) PhDME graduates will have a knowledge of professional and ethical responsibility.	➢ Graduate students will be assessed using CITI integrity modules with average scores reported	80%	N/A

V. Feedback Loop

The department has a Graduate Committee composed of the Graduate Coordinator and [illegible] faculty

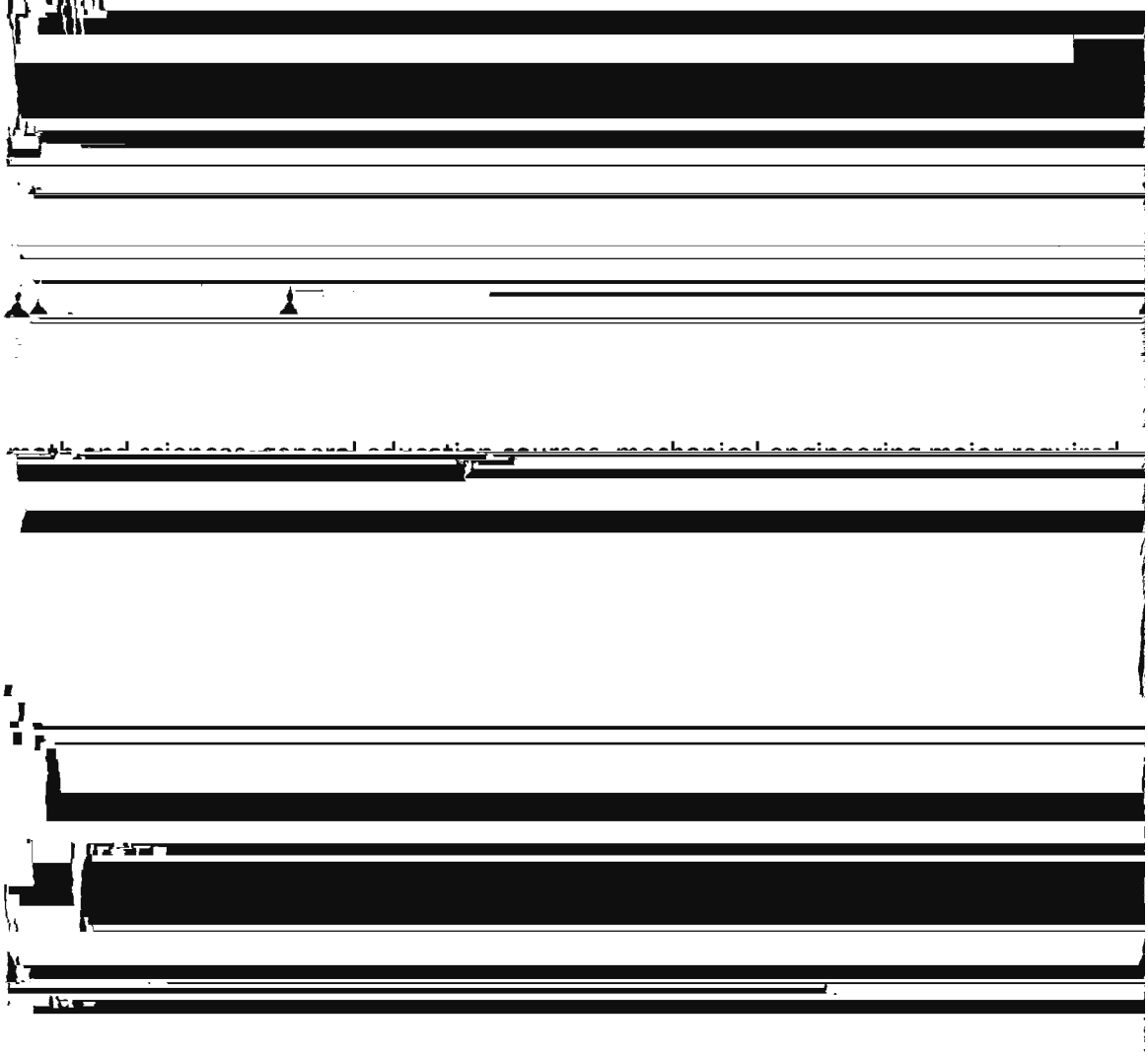
College: Engineering

Department/Program (s): Mechanical Engineering

Degree (s) Offered: MS, MS, PhD in Mechanical Engineering

Triggers: None

Brief Description of each degree:
The Bachelor of Science in Mechanical Engineering (BSME) program equips graduates with engineering methods, skills, and experience required to design, to develop, and to produce mechanical components or systems in any industry. The program prepares students for job responsibilities through a broad course of study that covers the basic



Assessment of the Quality of the Undergraduate Students:

[redacted]

Undergraduate students have a similar average ACT score to the University average [redacted]

[redacted]

outcomes.

Assessment of Learning Outcomes:

[redacted]

By April 1, 2013 (send to the Office of the Provost):

- Document that the program review process is a part of a continuous improvement approach involving all departmental faculty.
- Document program changes that occurred through assessment of student learner outcomes and other data collected

- The learning outcomes for all programs (and general education courses)