WICHITA STATE UNIVERSITY

Program Review

Self-Study Template

Revised 11-1-2019

Academic unit: Industrial, Systems and Manufacturing Engineering College: Engineering

Date of last review Fall 2018

Date of last accreditation report (if relevant) Fall 2022

List all degrees described in this report (add lines as necessary)

Degree: BS Industrial Engineering CIP* code: 14:35

Degree: BS Manufacturing Engineering CIP code: 14:36

Degree: MS Industrial Engineering CIP code: 14:35

Degree: MEM Engineering Management CIP code: 15:1501

Degree: PhD Industrial Engineering CIP code: 14:35

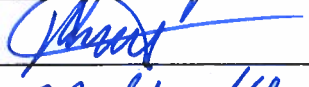
*To look up, go to: Classification of Instructional Programs Website, http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55

Certificate (s):

Faculty of the academic unit (add lines as necessary)

(If interdisciplinary, please list your core teaching faculty and department name if external to academic unit)

NAME (List department –if external to unit)	SIGNATURE	TENURE OR NON-TENURE TRACK
Sandeep Nannapaneni		TT
Laila Cure		TT
Deepak Gupta		TT
Michael Jorgensen		TT
Krishna K Krishnan		TT
Vis Madhavan		TT
Cindi Mason		NTT
Ehsan Salari		TT
Wilfredo-Moscoso Kingsley		TT

Gamal Weheba		TT
Mehmet Bayram Yildirim		TT
Enkhsaikhan Boldsaikhan		TT
Wujun Si		TT

Submitted by: Krishna Krishnan, Chair _____ Date 7/11/2022 _____
(Name and title) (Date)

In yellow highlighted areas, data will be provided

Part 1: Departmental Purpose, Relationship to the University Mission and Strategic Plan engagement

Please list the program purpose statement. Explain in 1-2 concise paragraphs the role of the program and tie them to the University mission (printed below) and strategic plan.

*The mission of Wichita State University is to be an essential **educational, cultural and economic driver** for Kansas and the greater public good.*

A. Program Purpose Statement - formerly Mission

(If more than one program, list each purpose statement):

The purpose of the BS in Industrial Engineering program is to prepare students through an experiential education to design, model, analyze, and manage modern complex systems in order to increase the effectiveness of manufacturing and service sector organizations.

The purpose of the BS in Product Design and Manufacturing Engineering program is to prepare students through an experiential education to design, model, analyze, and manage modern manufacturing materials and processes in order to increase the effectiveness of industrial organizations.

The purpose of the MS in Industrial Engineering program is to enhance the skills of degreed graduates by providing advanced knowledge and skills that are needed to design, model, analyze and manage modern complex systems in order to increase the effectiveness of manufacturing and service sector organizations.

The purpose of the Master's in Engineering Management program is to enhance the skills of degreed graduates which will increase their effectiveness in planning, decision making, complex problem solving, and managerial skills, while receiving advanced technical knowledge, in order to increase the effectiveness of manufacturing and service sector organizations.

The purpose of the PhD program in Industrial Engineering program is to provide training education for degreed engineers to perform research and advance the knowledge in the areas of Data Analytics, Operations Research and Systems Engineering, Production and Supply Chain Analytics, Quality and Reliability, Manufacturing Engineering and Automation, and Human Systems Engineering.

B. The role of the Program(s) and relationship to the University mission:

The role of the BS in Industrial Engineering program is to provide an undergraduate education to its students that will prepare the graduates to:

1. Be employed in jobs related to designing, modeling, analyzing, and managing modern complex systems, implementing and improving systems in manufacturing and service sectors at local, regional, national and global levels.
2. Have engaged in life-long learning, such as graduate studies and research, certification from professional organizations, Fundamentals of Engineering certification, or active participation in professional societies/activities.

3. Demonstrate professional success as evidenced by, among others, increased job responsibilities and leadership role at the place of employment and in greater society.

The role of the BS in Product Design and Manufacturing Engineering program is to provide an undergraduate education to its students that will prepare the graduates to:

1. Be engaged, innovative professionals and leaders in designing, modeling, analyzing, implementing, managing, and improving products, processes and systems in manufacturing sectors of local, regional, national and global industries
2. Pursue life-long learning, such as graduate studies and research, certification and licensure from professional organizations, etc.
3. Achieve professional success through the program's emphasis on experiential learning through solving real world problems.

The role of the MS in Industrial Engineering program is to provide a graduate education to its students that will prepare the graduates to:

1. Be employed in jobs related to design, model, analyze, and manage modern manufacturing materials and processes, implementation and improvement of systems in manufacturing and service sectors in local, regional, national and global levels. Pursue life-long learning, such as graduate studies and research, certification from professional organizations, FE/PE etc., and
2. Achieve professional success through the program's emphasis on applied learning through solving real-world problems.

The role of the Master's in Engineering Management program is to provide a graduate education to its students that will prepare the graduates to:

1. Be employed in jobs related to design, model, analyze, and manage modern manufacturing materials and processes, implementation and improvement of systems in manufacturing and service sectors in local, regional, national and global levels. Pursue life-long learning, such as graduate studies and research, certification from professional organizations, FE/PE etc., and
2. Achieve professional success through the program's emphasis on applied learning through solving real world problems.

The role of the PhD in Industrial Engineering program is to provide a graduate education to its students that will prepare the graduates to:

1. Be employed in jobs related to design, model, analyze, and manage modern manufacturing materials and processes, implementation and improvement of systems in manufacturing and service sectors in local, regional, national and global levels. Pursue life-long learning, such as graduate studies and research, certification from professional organizations, FE/PE etc., and
2. Achieve professional success through the program's emphasis on applied learning through solving real world problems.

The role and mission of the ISME department are consistent with the mission of the college of engineering and Wichita State University, which is to be an essential EDUCATIONAL, CULTURAL and ECONOMIC DRIVER for Kansas and the greater public good

C. Has the purpose of the Program(s) changed since last review? ☐ *Yes* ☒ *No*

If yes, describe in 1-2 concise paragraphs. If no, is there a need to change?

No

D. How does the Program support the university strategic plan?

The departments role statements for the BS, MS and PhD program in Industrial Engineering reflect the applied/experiential learning mission of the university. Thus, there is an emphasis on case studies and real-world problem solving in the education of our graduates. This experience includes industry-based two semester-long capstone design projects in the undergraduate programs. Organizations such as: Girls Scouts of America, Red Cross, WSU Admissions Department, Office of Research Administration, and the local hospitals have also sponsored projects. At the graduate level, there is more emphasis on industry-based class projects.

E. Provide an overall description of your program (s) including any changes made since the last review?

Undergraduate Programs

The BS in Industrial Engineering program focuses on the design, analysis, improvement, and management of systems in manufacturing and service organizations. Industrial engineers bridge the gap between management and operations while emphasizing process improvement. Industrial engineers are unique in engineering as they also take into consideration the human element in the design of these systems. The department's BS in Industrial Engineering program includes 125 credit hours of required course work. The program is designed such that the students can complete their degree in 4 years. The program consists of general education, required courses in industrial engineering, and 23 credit hours of technical electives. The program offers three tracks for specialization: 1) Manufacturing, Robotics, and Automation:, 2) Supply Chain and Analytics, and 3) Systems Engineering. The students also complete two industry-based senior design projects over the last two semesters of their study. The senior design projects are evaluated by industry and faculty.

The BS in Product Design and Manufacturing Engineering (PDME) program equips graduates with engineering methods, skills and experience required to develop and improve manufacturing processes and systems. The curriculum prepares graduates of this program to apply both deterministic and statistical analysis to identify problems and improve metrics such as productivity, quality, reliability, cost, waste, and sustainability. The department's BS PDME program includes 128 credit hours of required course work. The program is designed such that the students can complete their degree in 4 years. The program consists of general education, required courses in engineering (e.g. industrial and manufacturing engineering, aerospace engineering, and electrical engineering), and 15-credit hours of technical electives. The students also complete two industry-based senior design projects over the last two semesters of their study. The senior design projects are evaluated by industry and faculty.

To achieve the PEOs, the department ensures that all BS in Industrial Engineering and BS in Product Design and Manufacturing Engineering students demonstrate:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Both the BS in Industrial Engineering program and the Product Design and Manufacturing Engineering program undergo continuous refinement with input from faculty, students, alumni, and the Industrial Advisory Board. The Program Educational Objectives (PEOs) were refined in 2018 based on recommendations from the Industrial Advisory Board in consultation with the department constituents. The curriculum, lab development and other educational opportunities are analyzed and structured to meet the PEOs of the programs. The PEOs were refined to address the department's expanded focus on applied learning. Both BSIE and BSPDME program reduced their credit hours requirements from 129 to 125 and 134 to 128 in 2018. In addition, the old Manufacturing program was renamed to Product Design and Manufacturing Engineering reflecting the needs of industry and provide improved career opportunities for our graduates. Technical electives were also revised to provide flexibility while meeting the needs of industry.

Graduate Programs

The Master of Science in Industrial Engineering (MSIE) degree program prepares students for research and design in the areas of Data Analytics, Operations Research and Systems Engineering, Production and Supply

Chain Analytics, Quality and Reliability, Manufacturing Engineering and Automation, and Human Systems Engineering. Students can complete the degree requirement through any of the following options: thesis, directed project, or all coursework.

For the thesis option – the students must complete a minimum of 24 credit hours of coursework (consisting of core courses, major area courses, and technical electives) along with 6 credit hours of research (thesis). The students present a proposal for their research at least 3 months prior to the formal defense of their research work.

For the directed project option - the students complete a minimum of 30 credit hours of coursework (consisting of core courses, major area courses, and technical electives) along with 3 credit hours of research (directed project). A formal oral presentation is required to defend and complete the MS project.

For the coursework option – the students complete a minimum of 33 credit hours of coursework (consisting of core courses, major area courses, and technical electives). The students complete a terminal activity which can be either a one credit hour project at a local company or a certification from an external agency as part of the degree requirements.

The department ensures that all MS in Industrial Engineering students have:

1. the technical knowledge in the field of industrial and/or manufacturing engineering and professional skills to get employment and to advance in their field
2. the knowledge and academic background necessary to be accepted to other advanced degree programs
3. the ability to communicate effectively via technical papers and presentations

The Master's in Engineering Management (MEM) degree program is directed towards helping students develop planning, decision making, complex problem solving, and managerial skills while receiving advanced technical knowledge. The MEM program is structured for practicing technical professionals to enhance their breadth of knowledge in their specific field into management and business. The MEM program consists of a minimum of 33 credit hours of coursework.

The department ensures that all Master's in Engineering Management students have:

1. the technical knowledge in the field of industrial engineering and management and professional skills to get employment and to advance in their field
2. the ability to communicate effectively via technical papers and presentations

The PhD in Industrial Engineering program is directed towards training students to perform research and advance the knowledge in the areas of Data Analytics, Operations Research and Systems Engineering, Production and Supply Chain Analytics, Quality and Reliability, Manufacturing Engineering and Automation, and Human Systems Engineering. The PhD program consists of 48 credit hours of coursework (including up to a maximum of 24 credit hours from MS) and 24 credit hours of research. The students present a proposal for their research at least 6 months prior to the formal defense of their research work.

The department ensures that all PhD in Industrial Engineering students have:

1. a solid background, technical knowledge in the field of Industrial and/or Manufacturing Engineering, and professional skills to get employment and to advance in their field

2. the knowledge, professional skills, and good publication record in their research area to get employment in academic positions
3. the ability to communicate effectively via technical papers and presentations

The PhD in Industrial Engineering program was revised in 2019 to reduced required program hours from 84 to 72. This was done to ensure that students can focus on their research. MEM program hours were also reduced from 36 to 33 to attract more students to the program. In addition, MSIE program hours for coursework only option were reduced from 36 to 33. Changes in credit hours requirements were also made to offer a competitive curriculum compared to other leading institutions.

Part 2: Faculty Quality and Productivity as a Factor of Program Quality

The quality of the program/certificate as assessed by the strengths, productivity, and qualifications of the faculty in terms of scholarly/creative activity and service. (Refer to instructions in the WSU Program Review Instructions for more information on completing this section. Tables 4 (Instructional FTE), 6 (Program Majors) and 7 (Degree Production) from OPA can be used to help with this section.)

Complete the table below for the faculty who support the program (all faculty who signed or should have signed the coversheet).

Table 1 Departmental Outputs

Scholarly Productivity	Number Journal Articles		Number Presentations		Number Conference Proceedings		Performances			Number of Exhibits		Creative Work		No. Books	No. Book Chaps.	No. Grants Awarded or Submitted	$ Grant Value
	Ref	Non-Ref	Ref	Non-Ref	Ref	Non-Ref	*	**	***	Juried	****	Juried	Non-Juried				
2018-2019	8		12		25											9	338000
2019-2020	19		14		14											7	617000
2020-2021	20		29		12		NA									10	1820000
2021-2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

*Winning by competitive audition. **Professional attainment (e.g., commercial recording). ***Principal role in a performance. ****Commissioned or included in a collection.

A. Briefly explain the standards in place in your college/department for the evaluation of your faculty research/scholarship/creative activity. ***If an interdisciplinary program, please report on the program where faculty research has been recorded and provide narrative related to productivity.***

The department expects an average of 2 journal papers per year and about $50,000 per faculty on the research for all tenure track faculty. The annual evaluation of tenure-track faculty by the department chair is used to advise the faculty on their effectiveness in research. The department chair also reports out to the faculty on the annual research activity accomplishments after all FAR reports are obtained. ISME tenure and promotion committee which has all tenured faculty as members performs the evaluation of untenured tenure-track faculty to ensure direction and success for untenured faculty members in research. Next, the College dean and provost evaluate the program faculty. The Department chair provides a summary of accomplishments for the department to the college dean.

B. *Provide a brief assessment of the quality of the faculty/staff using the data from the table above. Include details related to productivity of the faculty including scholarship/research and creative activity and services. (i.e., some departments may have a few faculty producing the majority of the scholarship), service, efforts to recruit/retain faculty, departmental succession plans, etc.*

There are 13 faculty (12.5 FTE) in the ISME department. All faculty support the graduate programs. We have increased the number of faculty in manufacturing engineering to 3 (one new faculty). In addition, adjuncts with expertise in appropriate areas are hired to teach on a regular basis to support the programs. The potential addition of new faculty in the manufacturing program is expected to get the department back on increased research grants and journal papers.

Part 3: Academic Program(s) and Emphases

Analyze the quality of the program as assessed by its curriculum and impact on students for each program (if more than one). Attach updated program assessment plan(s) as an appendix (refer to instructions in the WSU Program Review document for more information).

A. Undergraduate programs:

1. Please review Table 8 provided by the Office of Planning and Analysis. Is the program ACT below 20 (triggered by KBOR defined Minima)? ☐ Yes ☒ No

   If yes, please explain the average ACT scores for your students.

   .

   Industrial Engineering: 24.6
   Product Design and Manufacturing Engineering: 23.7

B. Graduate programs:

1. Please review Table 9 provided by the Office of Planning and Analysis. Is the program GPA below the university average? Yes ☐ If yes, please explain the average GPA of your graduate students.
   Rolling average of the last 5 years available (3.5 is university average)
   Engr. Management: 3.2
   Industrial Engineering: 3.4

The program GPA is slightly below the university average of 3.5. Most of our students in the graduate program come from other countries that do not have a GPA system. Therefore, it is difficult to make a comparison with programs who admit mostly from the USA or countries with the GPA system. Note that most students admitted in the program successfully complete their degree at WSU.

C. Accreditation status: If accreditation is previously noted, please add:

Accrediting Body: ABET

Next Review Date: 2026

Commendations and concerns from the last review: No concerns

D. Assessment of Learning Outcomes

1. Complete the table below with program level data. Identify the principal learning outcomes (i.e., with what skills does your Program expect students to graduate) and provide aggregate data on how students are meeting those outcomes

You may add an appendix to provide more explanation/details. (If specialty accreditation has been conferred within 18 months of this process, programs can append the information from the accreditation document to this self-study and cite, with page number, the appropriate information. If specialty accreditation has not been affirmed within 18 months, please complete the table or submit an updated version of your accreditation information. If not accredited, please complete the table below.)

Table 2 Learning Outcome Assessment					
Learning Outcomes (most programs will have multiple outcomes)	Assessment Type (e.g., portfolios, exams)	Assessment Tool (e.g. rubrics, grading scale)	Target/Criteria (desired program level achievement)	Results	Analysis
Students will have a basic understanding of human anatomy.	*Comprehensive Exam*	*Rubric*	*80% of students will score 80% Or <*	*90% of students scored 80% or better.*	*Proficient knowledge of anatomy has been demonstrated.*
MS Industrial Engineering					
Outcome 1: Students will have an advanced understanding of analytical tools and techniques	Exams and quizzes	Grading scale	70% of students will score 75% or higher score	72.58%	Proficient knowledge of statistical evaluation tools and techniques has been demonstrated
Outcome 2: Students will demonstrate the ability to communicate effectively	Written papers and presentations	Grading scale	70% of students will score 75% or higher score	92.31%	Proficient knowledge of effective communication has been demonstrated
Master's of Engineering Management					
Outcome 1: Students will have an advanced understanding of analytical tools and techniques	Exams and quizzes	Grading scale	70% of students will score 75% or higher score	79.17%	Proficient knowledge of statistical evaluation tools and techniques has been demonstrated

Outcome 2: Students will demonstrate the ability to communicate effectively	Written papers and presentations		70% of students will score 75% or higher score	94.74%	Proficient knowledge of effective communication has been demonstrated
PhD in Industrial Engineering					
Outcome 1: Students will have an advanced understanding of analytical tools and techniques	Exams and quizzes	Grading scale	70% of students will score 80% or higher score	80%	Proficient knowledge of statistical evaluation tools and techniques has been demonstrated
Outcome 2: Students will demonstrate the ability to communicate effectively	Written papers and presentations		70% of students will score 80% or higher score	100%	Proficient knowledge of effective communication has been demonstrated

Definitions:
Learning Outcome: Learning that should result from instruction.
Assessment Type: Type of assessment used to identify, collect, and prepare data to evaluate the achievement of learning outcomes (e.g., a writing project evaluated by a rubric).
Assessment Tool: Instrument used to evaluate the achievement of learning outcomes.
Criterion/Target: Percentage of students expected to achieve the desired outcome for demonstrating program effectiveness (e.g., 90% of the students will demonstrate satisfactory performance on a writing project).
Result: Actual achievement on each learning outcome measurement (e.g., 95%).
Analysis: Determines the extent to which learning outcomes are being achieved and leads to decisions and actions to improve the program. The analysis and evaluation should align with specific learning outcome and consider whether the measurement and/or criteria/target remain a valid indicator of the learning outcome as well as whether the learning outcomes need to be revised

2. Provide an analysis and evaluation of the data by learner outcome with proposed actions based on the results listed in Table 2. Data should relate to the goals and objectives of the program as listed in Part 1.

Each course in the Industrial and Manufacturing Engineering department has clearly identified learner outcomes communicated in the syllabus.

Undergraduate Programs

At the undergraduate level, the Accreditation Board for Engineering and Technology (ABET) criterion is used as part of assessment. Based upon the ABET accreditation process, the student learning outcomes are assessed by measuring and ensuring that each undergraduate student in the BS in Industrial Engineering program has:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

In order to assess the full range of ABET learning outcomes; assessments were allocated to specific courses. The allocations are made such that each outcome was assessed in multiple courses and each core course assessed multiple outcomes, Table A.

Table A The allocation of 1-7 to specific courses for data collection

IME Course	**452**	**549**	**550**	**553**	**554**	**556**	**563**	**650**	**258**	**590/ 690**
Program Outcome	**Work Sys**	**Ergo**	**OR I**	**Prod. Plan**	**SQC**	**Info Sys**	**Facil**	**OR II**	**Mfg I**	**Sr Des**
1			X				X	**X**	X	X
2		X					X	X		X
3	X					X	X		X	X
4		X					X			X
5				X			X		X	X

6	X	X		X	X					
7	X		X				X			X

A sample format of the data assessment is shown in Table B. Table B shows that each learning outcome is assessed multiple times in multiple forms in this course. The performance is the ratio of points earned to total points available for the specific measure.

Table 3

		Outcomes																
	Instrument	1		2		3		4		5		6		7				
No	Description	M	N	M	N	M	N	M	N	M	N	M	N	M	N	Course	Year	Semester	Instructor
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
	Program Outcome Assessment (%>=target)																		

Table B Outcome assessment reporting form submitted for each course in assessment table

Feedback Loop:

In addition to the ABET based outcome assessment, some courses conduct a prerequisite assessment to assess the skills of incoming students. There is also a core competency exam administered to each graduating senior, an assessment by a panel of each capstone design project, and an anonymous exit survey assessing student perceptions of their abilities and the quality of their educational experience. The department's Curriculum and Assessment Committee assesses the results of the measures and may perform additional studies. Issues are identified and recommendations made to the faculty meeting as a committee of a whole. These assessments are the basis for the continued development of a more effective faculty.

Expected Level of Attainment

For the Student Outcomes, the target level of performance is as follows: at least 70% of the students should attain at least 70% or above for each student outcome collectively for all courses in which the outcome is assessed. Figure 4.2a shows the outcomes assessment reporting form for 2018 to present. Typically, the outcome assessment is performed for each academic year. However, after the changeover to the new ABET outcomes happened in Fall 2018, the IE faculty decided to include a semester-by-semester analysis to study the impact of the new outcomes.

Results Summary

If the cumulative assessment of a student outcome over all the courses in which it is measured is over 70%, the curriculum automatically achieves the 70% attainment level. However, course level verification of attainment helps to implement corrective actions at individual course level. Corrective actions are suggested by the instructor/course coordinator of the course, and discussions and analyses are performed at a faculty meeting for ABET assessment. If warranted, a plan for corrective actions is approved by department faculty. This plan is implemented by the course coordinator/instructor when the class is offered next time. For example, based on outcomes assessment, it was observed that students were not proficient in modeling and in Outcome 6. Based on individual course assessment of IME 550 Operations research I and IME 650 Operations Research II courses have developed additional materials for students. In addition, a GTA to cover help sessions for IME 550 Operations Research I was also proposed as additional help for improving the level of attainment in these outcomes for Outcome 6. In general, more than 70% of the students have performed at above 70% for each outcome.

Measures of the Student Outcomes for 2018-2020 are presented in Table B and Figure A. In all outcomes, the industrial engineering program has exceeded the target level of 70%, i.e., at least 70% of the students will have a performance better than 70% attainment of the skill and knowledge targeted in that assessment instrument, except in 2 semesters. In Fall 2018, outcome 6 attained a value of 66%. This was attributed to the new methods of measurement and it was decided that more data is needed prior to taking any action. In subsequent semesters, outcome 6 performed well above the minimum level. In Spring 2020, outcome 4 had fallen to 69%. This was discussed and it was concluded because of COVID-19 pandemic and the resulting switch to remote teaching, some of the courses could not measure this outcome. If there is a possibility of continued online teaching, new methods for measuring this outcome will be incorporated.

Table Ba Performance Assessment for 2018-2020

Semester	**Outcome 1**	**Outcome 2**	**Outcome 3**	**Outcome 4**	**Outcome 5**	**Outcome 6**	**Outcome 7**
Fall 2018	80%	73%	89%	86%	94%	66%	81%
Spring 2019	75%	97%	95%	92%	94%	78%	93%
Summer 2019	N/A	72%	100%	100%	N/A	N/A	N/A
Fall 2019	80%	89%	92%	87%	93%	82%	90%
Spring 2020	80%	76%	94%	69%	96%	88%	90%
Overall Assessment	**77%**	**84%**	**93%**	**87%**	**94%**	**80%**	**89%**

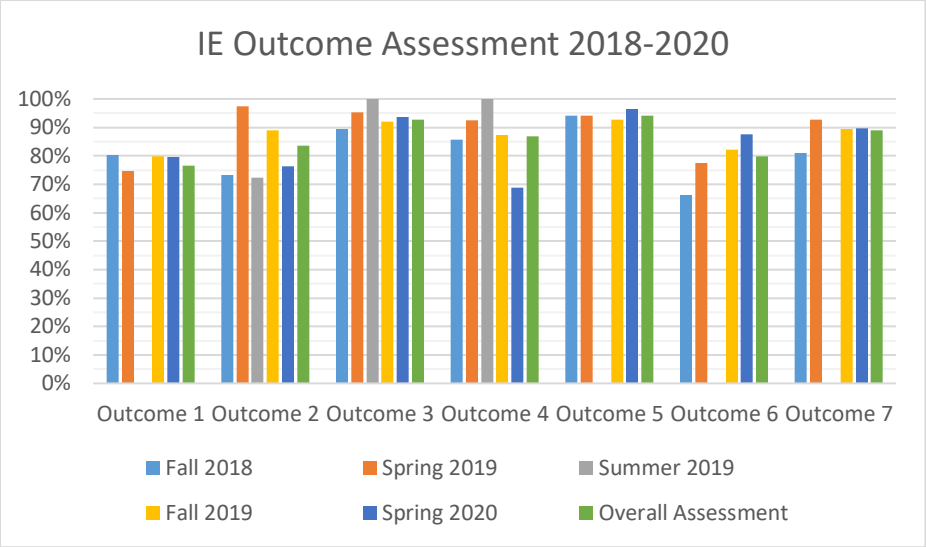


Figure A Fundamental Student Outcomes with a 70% target attainment level (2018-present).

An identical process is used to assess learning outcomes for the Manufacturing Engineering program with a change in the program specific outcomes at the end of the list.

Based upon the ABET accreditation process, the learning outcomes are assessed by measuring and ensuring that each undergraduate student in the BS in Manufacturing Engineering Industrial Engineering program has:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Table C illustrates the allocation of ABET outcome to program assessment learning outcomes for the 2017 academic year.

Table C. The allocation of 1-7 to specific required courses for assessment

Student Outcome	Mfg I 258	Mfg II 558	Prod. Plan 553	SQC 554	Kin. & Dyn 425	Rob. Prod Des 625	App. Cnrl. Sys 561	Robot Prog. 761	Airc. Man. Assy 676	Sr Design 590/ 690
1		X			X	X	X	X		X
2	X	X				X	X	X	X	X
3	X	X			X	X	X	X	X	X
4		X								X
5	X	X	X				X	X		X
6		X	X	X	X		X	X		
7						X	X	X		X

Feedback Loop: In addition to the ABET based outcome assessment, some courses conduct a prerequisite assessment to assess the skills of incoming students. There is also a core competency exam administered to each graduating senior, an assessment by a panel of each capstone design project, and an anonymous exit survey assessing student perceptions of their abilities and the quality of their educational experience. The department's Curriculum and Assessment Committee assesses the results of the measures and may perform additional studies. Issues are identified and recommendations made to the faculty meeting as a committee of a whole. These assessments are the basis for the continued development of a more effective faculty.

Expected Level of Attainment

For the Student Outcomes, the target level of performance is as follows: at least 70% of the students should attain at least 70% or above for each student outcome collectively for all courses in which the outcome is assessed. Figure 4.2a shows the outcomes assessment reporting form for 2018 to present. Typically, the outcome assessment is performed for each academic year. However, after the changeover to the new ABET outcomes happened in Fall 2018, the IE faculty decided to include a semester-by-semester analysis to study the impact of the new outcomes.

Results Summary

Student Outcomes (2018 – to date)

If the cumulative assessment of a student outcome over all the courses in which it is measured is over 70%, the curriculum automatically achieves the 70% attainment level. However, course level verification of attainment helps to implement corrective actions at individual course level. Corrective actions are suggested by the instructor/course coordinator of the course, and discussions and analyses are

performed at a faculty meeting for ABET assessment. If warranted, a plan for corrective actions is approved by department faculty. This plan is implemented by the course coordinator/instructor when the class is offered next time.

Measures of the Student Outcomes for 2018-2020 are presented in Table D and Figure C. In all outcomes, the product design and manufacturing engineering program has exceeded the target level of 70% i.e., at least 70% of the students will have a performance better than 70% attainment of the skill and knowledge targeted in that assessment instrument, except in 3 data points. In Fall 2018, outcome 6 attained a value of 66%. This was attributed to the new methods of measurement, and it was decided that more data is needed prior to taking any action. In subsequent semesters, outcome 6 performed well above the minimum level. In Spring 2019, outcome 1 fell to 60%. This was discussed and it was concluded that with the change in curriculum, IME 625 and IME 761 were being taught for the first time. In Summer 2019, outcome 2 attained only a 62% value. In Summer semester, the data is based on a single course IME 676, which led to the poor performance. The new courses contributed to the low performance and as instructors get more proficient, it was felt that the outcomes will be closely followed to ensure proper attainment. Because of Covid and the resulting switch to remote teaching, some of the courses could not measure this outcome. If there is a possibility of continued online teaching, new methods for measuring this outcome will be incorporated.

Table D Performance Assessment for 2018-2020

Semester	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6	Outcome 7
Fall 2018	87%	83%	92%	100%	99%	66%	92%
Spring 2019	60%	84%	92%	85%	89%	70%	94%
Summer 2019		62%	89%	79%			100%
Fall 2019	95%	100%	100%	76%	88%	84%	91%
Spring 2020	86%	81%	81%	100%	90%	82%	91%
Overall Assessment	77%	82%	93%	85%	91%	79%	93%

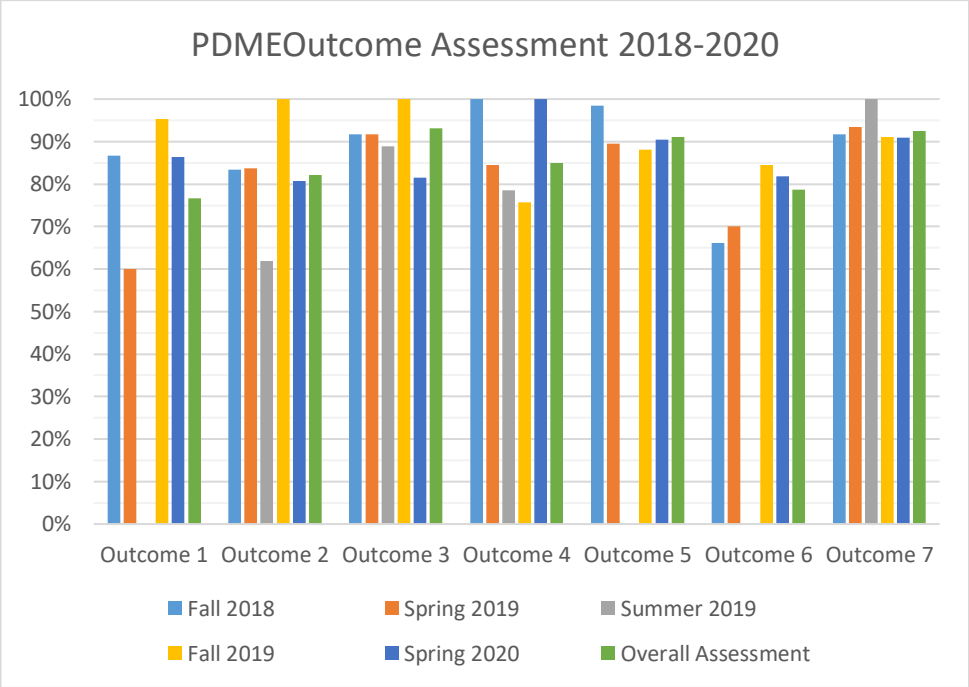


Figure C Fundamental Student Outcomes with a 70% target attainment level (2018-present).

Graduate Programs

The goals of the graduate programs (MS in Industrial Engineering, Master's in Engineering Management, and PhD in Industrial Engineering) are to ensure that graduates:

1. have an advanced understanding of analytical tools and techniques
2. demonstrate the ability to communicate effectively

The program goals are assessed on an annual basis using the following measures:

1. At least 70% of the MSIE as well as 70% of MEM students will score 75% or higher in analytical courses. In addition, at least 70% of the PhD IE students will score 80% or higher in those courses.
2. At least 70% of the MSIE as well as 70% of MEM students will score 75% or higher in courses with significant writing and presentation content. In addition, at least 70% of the PhD IE students will score 80% or higher in those courses.

Learner outcomes and assessment details are provided in Table 2. The results indicate that ISME graduate students achieve the learner outcomes above the target level in both learner outcomes. The ISME graduate committee will continue to evaluate program goals and associated measurement instruments to align them with curriculum changes, student population, and course offerings.

Feedback Loop:

1. Results of the student exit surveys are used to identify additional needs and suggestions. Course rotations and timings were updated to ensure timely graduation and appropriate course availability.
2. The departmental graduate committee will review the program outcomes and requirements each year and recommend changes. Data collection on corrective action will continue to be performed by the graduate committee.

Provide aggregate data on student majors satisfaction (e.g., exit surveys), capstone results, licensing or certification examination results (if applicable), employer surveys or other such data that indicate student satisfaction with the program and whether students are learning the curriculum (for learner outcomes, data should relate to the outcomes of the program as listed in 3c).

The three-year rolling average of "percent satisfied or very satisfied" is 82.0% and 85.7% respectively for the Industrial Engineering and Manufacturing Engineering programs (Table 10).

Learner Outcomes (e.g., capstone, licensing/certification exam pass-rates) by year, for the last three years				
Year	N	Name of Exam	Program Result	National Comparison±
1				
2				
3				

In general, MSIE, MEM and PhD students are very satisfied with the course offering. The MEM courses have been changed to be more flexible. This is expected to increase the satisfaction with course offerings.

ISME graduate committee will continue to meet to discuss: a) how the quality of ISME graduate programs could be improved, and b) new evaluation instruments.

A summary of the results of the exit survey for graduate students is presented in Table 11.

Based on the data from exit surveys, the three-year (2019-2021) rolling average of overall percent "satisfied or higher" is 91.0% and 87.1% respectively for the Industrial Engineering and Engineering Management programs. Based on the data provided for the self-study, the five-year (2016-2020) rolling average of overall percent "satisfied or very satisfied" is 91.2% and 76.7% for Industrial Engineering and Engineering Management programs respectively, while the most recent (2020) overall percent "satisfied or very satisfied" is 94.7% and 87.5% for Industrial Engineering and Engineering Management programs respectively.

E. Assessment of Student Satisfaction

Aggregate data supporting student success, by year, for the last three years (e.g., capstone, licensing/certification exam pass-rates)				
Year	N	Name of Exam	Program Result	National Comparison±
Ex. 1	*225*	*Praxis*	*80% of 225 were proficient*	*75% of testers are proficient*
2017				
2018				
2019				
2020	NA	NA	NA	NA

Table 4 Student Learning Outcomes Comparison

3. Use Table 3 and OPA Table 10 to provide analysis and evaluation using student majors' satisfaction (e.g., exit surveys from the Office of Planning and Analysis), capstone results, licensing or certification examination results (if applicable), employer surveys or other such data that indicate student satisfaction with the program and whether students are learning the curriculum (for learner outcomes, data should relate to the outcomes of the program as listed in 3d) to illustrate student satisfaction with the program and perceptions of program value.

	IE			PDME		
	2019	2020	2021	2019	2020	2021
Overall satisfaction with program	4	4	4.5	4.5	4	4
Satisfaction w quality of instruction	4	4	4	4.5	4	4
Competent in content of major	4	4	4.5	5	4	4
Competent in oral writ comm	4	4	5	4.5	4	4
Competent in numerical literacy	4	4	5	5	4	4
Competent in critical thinking	4.5	4	5	4.5	4	4
Competent in team work	5	4	5	4	4	4

Competent in diversity & globalization	4	4	5	4.5	3	4

The results indicate that the median score for students the overall satisfaction of the program is over 4. In addition, students are satisfied with faculty on feedback of course work, and quality of instruction with a median score over 4. These median scores are at least in par or better than other College of Engineering degree programs.

F. General Education

1. Does your program support the university General Education program? ☐ Yes **No**

If yes, please complete the table below by listing the general education courses and noting which of the general education outcomes are addressed in the class. If no, skip this question.

Table 5 General Education Outcomes

Course	Results	Assessment Type	General Education Outcomes			
			Have acquired knowledge in the arts, humanities, and natural and social sciences	Think critically and independently	Write and speak effectively	Employ analytical reasoning and problem-solving techniques
Math 242: Calculus I	*2015: 96% passed* *2016: 87% passed* *2017: 96% passed*			*x*		*x*

Note: Not all programs evaluate every goal/skill. Programs may choose to use assessment rubrics for this purpose. Sample forms available at: http://www.aacu.org/value/rubrics/

2. Use Table 4 to further explain which goals of the *WSU General Education Program* are assessed in undergraduate programs (optional for graduate programs) and the results.

Concurrent Enrollment

1. Does the program offer concurrent enrollment courses? ☐ Yes **No**

If yes, provide the assessment of such courses over the last three years (disaggregated by each year) that assures grading standards (e.g., papers, portfolios, quizzes, labs, etc.) course management, instructional delivery, and content meet or exceed those in regular on-campus sections.

If no, skip to next question.

G. Credit Hours Definition

1. Does the Program assign credit hours to courses according to Wichita State University Policy 2.18?
Yes ☐ If no, provide explanation.

H. Overall Assessment

1. Define the overall quality of the academic program based on the above information and other information you may collect, including outstanding student work (e.g., outstanding scholarship, inductions into honor organizations, publications, special awards, academic scholarships, student recruitment and retention).

There are 13 faculty (12.5 FTE) in the ISME department. All faculty support the undergraduate and graduate programs. We have increased the number of faculty in manufacturing engineering to 3 (one new faculty). In addition, adjuncts with expertise in appropriate areas are hired to teach on a regular basis to support the programs. The potential addition of new faculty in the manufacturing program is expected to get the department back on increased research grants and journal papers.

The graduate program enrollment is one of the highest in the Midwest for IE programs. The undergraduate program has also been steadily increasing. The demand for IE and manufacturing engineers is also high. The overall satisfaction with the programs is strong for both undergraduate and graduate programs.

Part 4: Student Need and Employer Demand

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

Complete the table below.

Table 6 Employment of Majors

	Avg. Salary	Employment In state (%)	Employment in the field (%)	Employment related to the field (%)	Employment outside the field (%)	Pursuing graduate or professional education (N)	Projected growth from BLS**
2019	58600	75	100		0	9.1	14%
2020	52250	25	75		25	11	14%
2021	65000	75	100		0	12.5	14%

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

A. Provide a brief assessment of student need and demand using the data from Tables 11-15 from the Office of Planning and Analysis and from the table above. Include the most common types of positions, in terms of employment graduates can expect to find. Also address students enrollment, degree production and employment outcomes for diverse students.

The five year average for student enrollment at undergraduate and graduate level are 36 (26 IE and 10 Manufacturing) and 90 (69 IE, and 21 Eng Management) showing an increasing trend. The redesign of the manufacturing program has increased the number of students in the program significantly. If additional manufacturing faculty could be hired in the area of smart manufacturing, ISME department expects the number of students to increase significantly in that program.

The five-year average for degree production at undergraduate (IE and manufacturing) and graduate masters and PhD level are 30 (26 IE, 4 manufacturing), 61 (49 IE and 12 Eng. Management) and 7, respectively. It is worth mentioning that even though the average degree production for the manufacturing/PDME program is listed as 4 over the five-year period for the report, the program has already graduated an additional 10 students between Fall 2021 and Spring 2022. This will significantly change the overall average when next report is developed for the program.

Most of the ISME students find jobs in the state of Kansas and in the ISME fields. The projected growth for ISME degrees is promising at a 14% rate. About 10% of ISME undergraduates immediately pursue a masters degree upon graduation.

Part 5: Program Service

Analyze the service the Program/certificate provides to the ***discipline, other programs at the University, and beyond****. Complete for each program if appropriate.* ***Data tables 1, 2, 3 and 5a, b and c provided by the Office of Planning Analysis (covering SCH by FY and fall census day, instructional faculty; instructional FTE employed; program majors; and degree production) can be used to partially address this section.*** *(Refer to instructions in the WSU Program Review document for more information on completing this section).*

A. *Provide a brief assessment of the service the Program provides using SCH by majors and non-majors.*

ISME Department generates about 8400 Ch per year during 2019 and 2020. About 5200 of these hours are from 100-499 level courses. Although the OPA data suggests that more than 50% of the credit hours are taken by non-program majors, several of the ISME courses attract students from other engineering majors as well, this data may not be accurate. However, in most of our undergraduate and graduate courses, ISME department has relatively significant number of non-majors.

The ISME department also has a policy of open lab usage to all units across the campus. Thus, we provide assistance to all units on campus with respect to the manufacture and prototype work. This has allowed students and faculty from all departments being helped in their course work and research work. For example, the department has manufactured prototypes for aerospace engineering program, mechanical engineering, chemistry department, biomedical engineering, etc.

B. *Provide a brief assessment of the service the Program/certificate provides to* ***other university programs.***

C. Provide a brief assessment of the service the Program/Certificate provides to the institution and beyond.

- The ISME department undergraduate senior design projects are all based on local industry at the
- Two faculty work in energy assessment and to help companies be more efficient
- The ISME department has several projects that assist local industry - We have about 14 students employed at Spirit through WSU.
- Dr. Yildirim works on projects at Sunflower Electric to make the company more optimized in power delivery to Wichita resident

Part 6: Graduate Enrollment Management (GEM)

For each graduate program, summarize and reflect on the progress you have made toward your GEM plan following the (a)-(d) template.

A. Briefly summarize the GEM plan, paying particular attention to the vision, actions, and GEM evaluation.

The graduate enrollment management (GEM) plan developed by the department is intended to be aspirational and holistic, aiming to identify program aspirations over the short, medium, and long-terms, define the steps needed to achieve those goals, ensure that all processes and investments are working together towards those aspirations, identify and address weak points, maximize impact of our graduate programs, articulate the program's vision to others.

The GEM plan for ISME aligns resources, investments, and reporting to improve enrollment, graduation rates, research and applied learning, and student success. We aspire to maintain 2.5 PhDs and 12 MSIE/MEM per tenure track full-time faculty.

B. Discuss how graduate assistantships are being used to advance the GEM goals.

Most of the faculty members in the department meet students up front to evaluate the likelihood of success and then recruit them especially at the PhD level. Depending on the location of prospective students, these meetings are scheduled in-person or via Zoom. Such meetings have been helpful in identifying well-qualified candidates for graduate assistantships, especially at the PhD level.

The department utilizes UGRA as a matching fund for PhD students. To ensure that we are recruiting a diverse group of students in all of our graduate programs, these assistantships are offered to students in all three graduate programs.

C. *Provide an assessment of successes, challenges, and deficiencies with the GEM plan.*

Funding from the University to department for graduate students has decreased significantly leading to reduced opportunities for student recruitment.

Number of MS per faculty, and number of PhD per faculty is one of the highest in the university

Increasing number of PhDs and MS Students through assistantships & effective use of assistantship money

Graduate school can provide teaching assistantships as state lines – so that we can hire more US PhD students. This will allow faculty to have bridge funds when the projects run out of money. The ISME department would like to have at least 6 TA positions as state lines for a budget of about $36,000 per semester.

All assistantships should be provided as block grants so that a heavily grad program focused department such as ISME, can direct its resources more effectively to hire graduate students.

In addition to traditional research grants, ISME department is exploring additional collaboration opportunities with NIAR, Spirit AeroSystems, Airbus, etc. to support assistantships for graduate students. We will strive to have at least one industry project every year that can support 2-5 students.

Recruiting higher quality MS & PhD students

MOUs can be signed with good quality engineering programs in international universities. In addition to traditional agreements, we will also explore opportunities to complete more than six hours at home institution before transferring to WSU.

Research collaborations may be developed with international institutions which will lead to indirect marketing of WSU programs. This may be done by providing summer appointments for international faculty-budget required $5,000 per year.

Most international students come to the US universities for future career opportunities. Industry collaborations and projects will be explored to identify career opportunities for international students. This will help us market our programs effectively within the international markets.

Instead of identifying recruiting agencies, identify universities and programs that are highly ranked and establish direct ties with them. This will also help in reducing the cost & time for applying to WSU.

Grad School should lead the efforts to identify these universities. They can also provide funding to departments to travel and recruit from universities – Budget required $6,000 per year.

Increase the number of Faculty

The ISME department has a higher than normal emphasis on graduate programs. The current emphasis on student head count severely disadvantages graduate programs. Hence, graduate school has to be an advocate for increase in faculty positions for grad programs that have higher numbers in grad programs.

Reduced Course Load for Research Active Faculty and higher salaries/incentives

Most Tier I research institutions are on a 1+1 course load. If WSU wants to be competitive and retain research productive faculty, we have to start providing course load reductions without the need to buy-out of courses. With the current number of faculty, it is impossible to have a reduced course load. However, WSU has several research centers, with which faculty have no or minimal relationship. The effective use of these research centers to leverage faculty and provide a reduced course load would be a great service to the graduate programs. Grad School should be an advocate for the effective utilization of the existing research centers. Having faculty as lab directors can also reduce cost for these centers while bringing well qualified researchers to the center.

Another issue in retaining high quality faculty at WSU is the low salaries. Although WSU has been targeting infrastructure development, as long as salaries are low, the faculty retention will continue to remain an issue. Research active faculty may be provided incentives to support their salary levels during academic year as well as the summer. The current buy-out model discourages reduced course load. In addition, there is significant salary compression for senior faculty members. Grad School should advocate upper administration for the identification of funds for faculty retention and the development of a research incentive model similar to that at other research institutions.

D. Summarize how the GEM plan is being updated going forward based on the findings above.

Instead of focusing on goals to continually increase student population which is not realistic based on population trends and availability of resources, the department is concentrating its efforts on retention.

For PhD program, new faculty recruitment has not happened. The department continues to work with the college and request additional budget to recruit new faculty. Lack of new funding will continue to affect our aspirational GEM plans.

Sustainability of department needs more faculty and resources

It would be great to have funds from the college or graduate school for PhD students who are sponsored through grants (e.g., 100% tuition waiver from university, not from the PI or department)

Part 7: Undergraduate Enrollment Management

For each undergraduate program, summarize and reflect on the progress you have made toward your colleges enrollment goals.

A. Briefly describe how the department and faculty have engaged in undergraduate strategic enrollment management including both recruitment and retention initiatives and activities.

The department assists the admissions office by providing campus visits. We also respond/participate in other admission office events to help with recruitment. The department also responds to all queries from prospective students. ISME Department supports the retention efforts at the college. Furthermore, Dr. Mason, a retention fellow, and ISME undergraduate coordinator, has been leading the efforts in retention at the ISME Department and the College of Engineering.

B. Provide an assessment of successes, challenges, and deficiencies with departmental activities.

Based on the campus visit surveys for assessment of success, all survey responses are very positive.

Part 8: Impact of Previous Self-Study Recommendations

At the conclusion of the last program self-study performed, the committee provided recommendations for improvement for the department. Please list those recommendations and note your progress to date on implementation.

Complete the table.

Table 7 Changes made based on Previous Recommendations

Recommendation	Activity	Outcome

- Programs should be more clearly documented with revised outcomes that are measurable
    - ISME is utilizing ABET student outcomes for assessment, which is required for accreditation.
- Assessment tools should also be clarified (pg. 10 UG) and extend beyond reliance on courses and narrative should address the target/criteria, results and analysis
    - Rubrics used for ABET are utilized at undergraduate level.
- Special attention should be made to strengthen graduate learning outcomes
    - The graduate committee has been working on an assessment plan for graduate programs. Currently, data is being collected using assessment tools in courses that are taken by majority of the graduate students. This plan represents the overall graduate program progress as opposed to a smaller population of graduate students used in the previous plans.

- UG exit interviews suggest improvements needed with both instruction and advising
    - The ISME department invests a significant amount of time in continuous improvement processes which are also required for the ABET accreditation during several faculty meetings every academic year. The faculty implements several recommendations for improving student outcomes every year. The overall satisfaction with IE and PDME programs has increased from 81.7 and 61.5% to 82.0 and 85.7% when 2016-2018 and 2019-2022 are compared.
- SWOT analysis should be clearly linked to program goals
    - ABET assessment process is used instead of SWOT
- Service to greater university and community should be noted
    - ISME department has courses taken by several other majors.
    - Faculty doing service at college and university level (at least one committee at college and university level)
    - Faculty has service at national level
    - Faculty is very active helping Kansas Industry and economic development

Part 9: Program Goals from Last Review

Report on the Program's/certificate's goal (s) from the last review. List the goal(s), data that may have been collected to support the goal, and the outcome. Complete for each program if appropriate (refer to instructions in the WSU Program Review document for more information on completing this section).

Plan/Goals

1. Continue to increase lab and problem based learning will be a significant component of the pedagogical approach employed by the department

ISME Department has invested in three new labs (Robotics Lab, Industry 4.0 Lab, and Work Systems Lab) to enhance students' ability to learn, and provide applied learning opportunities. These labs are utilized in both IE and PDME programs.

2. Continue to increase research funding for the departments.
    a. The research funding is at similar levels.

Complete the table.

Table 8 Results of Goals from Last Review

(For Last 4 FYs)	Goal(s)	Assessment Data Analyzed	Outcome	Status (Continue, Replace, Complete)
	Continue to increase lab and problem based learning will be a significant component of the pedagogical approach employed by the department	Department invested in new infrastructure and changed the curriculum to emphasize lab and problem based learning	ISME Department invested in the Robotics Lab, Industry 4.0 Lab, and Work Systems Lab	Continue
	Continue to increase research funding for the departments.	This is analyzed at per faculty level	Similar level	Continue. Department strategic plan requires recruiting new faculty in digital manufacturing which also has significant potential for funded research.

Part 10: Forward-facing Goals

Identify goal(s) for the Program to accomplish in time for the next review. Goals must be **Specific, Measurable, Attainable, Realistic and Time-bound (SMART)** and should be tied to the university and college strategic plans.

Complete the table.

Table 9 Forward Facing Goals for Program Review Period

Program/Certificate Goal	Specific	Measurable	Attainable	Realistic	Time-bound
Ex. To improve student learning outcomes (exam scores) by supporting Supplemental Instruction from four sections to seven by fall 2020.	*Yes – Exam Scores*	*Yes – How many sections.*	*Yes – budget approved. Discussed with OSS.*	*Yes – Within the scope of responsibility.*	*Yes – Fall 2020*
Maintain MS per tenure track faculty	Yes	12 per faculty	Yes	Yes	Fall 2022
Maintain PhD per tenure track faculty	Yes	2.5 per faculty	Yes	Yes	Fall 2022
Research funding: Maintain at or above average level at the college	Yes	$60,000 per faculty	Yes pending new resources	Yes pending new resources	Fall 2024
Scholarly activity: Maintain at or above average level at the college	Yes	2 journal papers per faculty	Yes	Yes	Fall 2022

Provide any additional narrative covering areas not yet addressed.