APPROVAL FORM FOR

DEGREE PROGRAMS

MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

College: BCoE **Department:** Industrial and Systems Engineering

Contact Person: Dr. Mohammad Marufuzzaman **Mail Stop:** 9542
E-mail: maruf@ise.msstate.edu

Nature of Change: Modification **Date Initiated:** 4/17/2024 **Effective Date:** 08/16/2024

Degree Program Name: Master of Science in Industrial and Systems Engineering

Major: Industrial and Systems Engineering
Concentration:
1. Human Factors and Ergonomics
2. Industrial Systems
3. Operations Research
4. Management Systems Engineering
5. Manufacturing Systems
6. Data Analytics

Proposed changes: Changing the 8000-level course requirements for all the non-thesis MS concentrations (listed above) from 15 to 12 hours

Summary of Proposed Changes: The proposed changes will keep our program in line with our peer schools' programs and students' choices of coursework. The proposed changes have already been initiated and approved by the graduate school. ISE complied with those initiatives in this proposed revision.

Approved: **Date:**

4/16/2024

Department Head

Dr. T.J. Jankun-Kelly Digitally signed by Dr. T.J. Jankun-Kelly
Date: 2024.04.17 17:24:42 -05'00'

Chair, College or School Curriculum Committee

Dorien Ponceful Frans - Dir. Acad. Qual. 4/17/2024

Dean of College or School

Chair, University Committee on Courses and Curricula

Chair, Graduate Council(if applicable)

Chair, Deans Council

GRADUATE DEGREE MODIFICATION OUTLINE FORM

Use the chart below to make modifications to an existing Graduate Degree. All deleted courses and information should be shown in *italics* and all new courses and information in bold. Please include the course prefix, number, and title in both columns. Expand rows as needed.

CURRENT Degree Description	PROPOSED Degree Description
Degree: M.S. Major: Industrial and Systems Engineering Concentrations: Human Factors and Ergonomics, Industrial Systems, Operations Research, Management Systems Engineering, Manufacturing Systems	Degree: M.S. Major: Industrial and Systems Engineering Concentrations: Human Factors and Ergonomics, Industrial Systems, Operations Research, Management Systems Engineering, Manufacturing Systems
Old degree catalog description: Admission Criteria Typically, an entering M.S. student should have a grade point average of 3.00 out of 4.00 for the junior and senior years. Likewise, an entering Ph.D. student with an M.S. degree should have a 3.50 out of 4.00 grade point average on the M.S. work, while a Ph.D. student entering with only a B.S. degree is expected to have a 3.50 out of 4.00 on the last two years of the undergraduate program. A student with a lower GPA may still be eligible for admission based on outstanding qualifications in other areas. All entering students must submit GRE general-test scores. International students must have a minimum TOEFL score of 550 PBT (79 iBT) or IELTS score of 6.5. The department reviews completed applications four times a year: February 15, May 15, August 15, and November 15. Incomplete or not fully processed applications will be reviewed during the next cycle. Provisional Admission An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's Program of Study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student shall be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. While in the provisional status, a student is not eligible to hold a graduate assistantship. Academic Performance In addition to the criteria defined in the current Bulletin	New degree catalog description: With the proposed degree program modification, all degree catalog description will remain unchanged.

of the Graduate School, unsatisfactory performance in the graduate program in Industrial and Systems Engineering is defined as any of the following.

- Failure to maintain a 3.00 average in the M.S. program or 3.30 in the Ph.D. program,
- Failure of the qualifying exam (Ph.D. students only),
- Failure of the preliminary exam (Ph.D. students only);
- Failure of the comprehensive final exam (M.S. non-thesis option only),
- Unsatisfactory evaluation of thesis or dissertation, or
- A failure of the required component of the program of study.

Any one of these will constitute the basis for review for possible dismissal. If the students drops six or more quality points below the required average (3.00 for M.S. or 3.30 for Ph.D.), the graduate coordinator will review the record along with the student's graduate committee and will recommend a final course of action, which will be immediate dismissal or the establishment of a probationary period in which corrective action must take place.

While on probation, the student is not eligible to receive an assistantship and is required to raise his/her cumulative GPA to 3.00 for M.S. or 3.30 for Ph.D. by the end of the following semester of enrollment. During that semester, the student must enroll in 9 credit hours of coursework; Directed Individual Study courses are excluded.

Old Concentration description:

Master of Science in Industrial Engineering with Human Factors and Ergonomics Concentration (HFE) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 3123
- IE 4613/6613

IE 6773	Systems Simulation I	3
IE 6623	Engineering Statistics II	3
At least 3 HFE ISE courses		9
IE 9000	Thesis Research/ Thesis in Industrial	6

New Concentration description:

Master of Science in Industrial Engineering with Human Factors and Ergonomics Concentration (HFE) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 3123
- IE 4613/6613

IE 6773	Systems Simulation I	3
IE 6623	Engineering Statistics II	3
At least 3 HFE ISE courses		9
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6

Engineering	
At least one non-HFE ISE course	3
At least one course from Mathematics (MA) or Statistics (ST) or Computer Science and Engineering (CSE)	3
At least one course from a supporting area (Biological Engineering [ABE], Psychology [PSY], Kinesiology [KI], Mechanical Engineering [ME], Mathematics [MA], Statistics [ST], etc.)	3
Total Hours	30

A thesis and an oral comprehensive examination in defense of the thesis are required.
Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. *IE 9000 does not apply to M.S. students.*

Master of Science in Industrial Engineering with Human Factors and Ergonomics Concentration (HFE) - Non-Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 3123
- IE 4613/6613

IE 6773	Systems Simulation I	3
IE 6623	Engineering Statistics II	3
At least three HFE ISE courses		9
At least two non-HFE ISE courses		6
At least one course from Mathematics (MA) or Statistics (ST) or Computer Science and Engineering (CSE)		6
At least one course from a supporting area (Biological Engineering [ABE], Psychology [PSY], Kinesiology [KI], Mechanical Engineering [ME], Mathematics [MA], Statistics [ST], etc.)		3

At least one non-HFE ISE course	3
least one course from Mathematics (MA) or Statistics (ST) or Computer Science and Engineering (CSE)	3
At least one course from a supporting area (Biological Engineering [ABE], Psychology [PSY], Kinesiology [KI], Mechanical Engineering [ME], Mathematics [MA], Statistics [ST], etc.)	3
Total Hours	30

A thesis and an oral comprehensive examination in defense of the thesis are required.
Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Human Factors and Ergonomics Concentration (HFE) - Non-Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 3123
- IE 4613/6613

IE 6773	Systems Simulation I	3
IE 6623	Engineering Statistics II	3
At least three HFE ISE courses		9
At least two non-HFE ISE courses		6
At least one course from Mathematics (MA) or Statistics (ST) or Computer Science and Engineering (CSE)		6
At least one course from a supporting area (Biological Engineering [ABE], Psychology [PSY], Kinesiology [KI], Mechanical Engineering [ME], Mathematics [MA], Statistics [ST], etc.)		3
Total Hours		30

Total Hours	30

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE *8000* Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program.
2. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum.
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. *IE 9000 does not apply to M.S. students.*

Master of Science in Industrial Engineering with Industrial Systems Concentration (SYS) - Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 3123
- IE 3913
- IE 4333
- IE 4613/6613

IE 6773	Systems Simulation I	3
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6
All other courses to be selected by the student along with the academic advisor and graduate program committee		21
Total Hours		30

A thesis and an oral comprehensive examination in defense of the thesis are required.
Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate

A written and oral comprehensive final exam on the coursework. At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE **9000** Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program.
2. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum.
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Industrial Systems Concentration (SYS) - Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 3123
- IE 3913
- IE 4333
- IE 4613/6613

IE 6773	Systems Simulation I	3
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6
All other courses to be selected by the student along with the academic advisor and graduate program committee		21
Total Hours		30

A thesis and an oral comprehensive examination in defense of the thesis are required.
Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 15 hours of

program
3. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. *IE 9000 does not apply to M.S. students.*

Master of Science in Industrial Engineering with Industrial Systems Concentration (SYS) - Non-Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 3123
- IE 3913
- IE 4333
- IE 4613/6613

At least 15 hours of 8000-level courses selected by the student along with the academic advisor and grade program committee.	15
Other courses to be selected by the student along with the academic advisor and grade program committee.	15
Total Hours	30

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE *8000* Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program.
2. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. *IE 9000 does not apply to M.S. students.*

Master of Science in Industrial Engineering with

courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Industrial Systems Concentration (SYS) - Non-Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 3123
- IE 3913
- IE 4333
- IE 4613/6613

At least **12** hours of 8000-level courses selected by the student along with the academic advisor and grade program committee.	**12**
Other courses to be selected by the student along with the academic advisor and grade program committee.	**18**
Total Hours	30

A written and oral comprehensive final exam on the coursework. At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE **9000** Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program.
2. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Management Systems Engineering Concentration (MGTS) – Thesis

Management Systems Engineering Concentration (MGTS) – Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the MSE Technical Committee
- IE 3913
- IE 4613/6613

IE 6513	Engineering Administration	3
IE 6533	Project Management	3
IE 6573	Process Improvement Engineering	3
IE 8583	Enterprise Systems Engineering	3
IE 8913	Engineering Economy II	3
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6
At least two non-MSE ISE courses		6
Course to be selected by the student along with academic advisor and graduate program committee		3
Total Hours		30

A thesis and an oral comprehensive examination in defense of the thesis are required.
Additional requirements are:

1. A minimum of 12 hours at the 8000-level is required.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. *IE 9000 does not apply to M.S. students.*

Master of Science in Industrial Engineering with Management Systems Engineering Concentration (MGTS) - Non-Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-*accedited* program or permission from the MSE Technical Committee
- IE 3913
- IE 4613/6613

IE 6513	Engineering Administration	3

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the MSE Technical Committee
- IE 3913
- IE 4613/6613

IE 6513	Engineering Administration	3
IE 6533	Project Management	3
IE 6573	Process Improvement Engineering	3
IE 8583	Enterprise Systems Engineering	3
IE 8913	Engineering Economy II	3
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6
At least two non-MSE ISE courses		6
Course to be selected by the student along with academic advisor and graduate program committee		3
Total Hours		30

A thesis and an oral comprehensive examination in defense of the thesis are required.
Additional requirements are:

1. A minimum of 12 hours at the 8000-level is required.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Management Systems Engineering Concentration (MGTS) - Non-Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-**accredited** program or permission from the MSE Technical Committee
- IE 3913
- IE 4613/6613

IE 6513	Engineering Administration	3
IE 6533	Project Management	3
IE 6573	Process Improvement Engineering	3
IE 8583	Enterprise Systems Engineering	3

IE 6533	Project Management	3
IE 6573	Process Improvement Engineering	3
IE 8583	Enterprise Systems Engineering	3
IE 8913	Engineering Economy II	3
At least two non-MSE ISE courses		6
Other courses to be selected by the student along with the academic advisor and graduate program committee		9
Total Hours		30

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE *8000* Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
2. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Manufacturing Systems Concentration (MFGS) – Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the Manufacturing Systems Technical Committee
- Computer programming proficiency
- IE 4333/6333
- IE 4613/6613

IE 6653	Industrial Quality Control	3
IE 8333	Production Control Systems II	3
IE 6773	Systems Simulation I	3
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6
At least two Manufacturing Systems ISE courses		6
At least two non-Manufacturing Systems ISE courses		6
IE 8913	Engineering Economy II	3
At least two non-MSE ISE courses		6
Other courses to be selected by the student along with the academic advisor and graduate program committee		9
Total Hours		30

A written and oral comprehensive final exam on the coursework. At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE **9000** Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
2. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Manufacturing Systems Concentration (MFGS) – Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the Manufacturing Systems Technical Committee
- Computer programming proficiency
- IE 4333/6333
- IE 4613/6613

IE 6653	Industrial Quality Control	3
IE 8333	Production Control Systems II	3
IE 6773	Systems Simulation I	3
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6
At least two Manufacturing Systems ISE courses		6
At least two non-Manufacturing Systems ISE courses		6
Course to be selected by the student along with the academic advisor and graduate program committee		3
Total Hours		30

Course to be selected by the student along with the academic advisor and graduate program committee	3
Total Hours	30

A thesis and an oral comprehensive examination in defense of the thesis are required.
Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Manufacturing Systems Concentration (MFGS) - Non-Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the Manufacturing Systems Technical Committee
- Computer programming proficiency
- IE 4333/6333
- IE 4613/6613

IE 6653	Industrial Quality Control	3
IE 8333	Production Control Systems II	3
IE 6773	Systems Simulation I	3
At least two Manufacturing Systems ISE courses		6
At least two non-Manufacturing Systems ISE courses		6
Other courses to be selected by the student along with the academic advisor and graduate program committee		9
Total Hours		30

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE *8000* Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may

A thesis and an oral comprehensive examination in defense of the thesis are required.
Additional requirements are:

5. A minimum of 12 hours coursework must be at the 8000-level or higher.
6. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
7. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
8. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Manufacturing Systems Concentration (MFGS) - Non-Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the Manufacturing Systems Technical Committee
- Computer programming proficiency
- IE 4333/6333
- IE 4613/6613

IE 6653	Industrial Quality Control	3
IE 8333	Production Control Systems II	3
IE 6773	Systems Simulation I	3
At least two Manufacturing Systems ISE courses		6
At least two non-Manufacturing Systems ISE courses		6
Other courses to be selected by the student along with the academic advisor and graduate program committee		9
Total Hours		30

A written and oral comprehensive final exam on the coursework. At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE **9000** Research/Thesis does not apply to non-thesis students.

Additional requirements are:

4. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
5. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum

list ST 8114 or IE 6613 on his/her graduate program
2. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Operations Research Concentration (OPRS) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 4613/6613

IE 6733	Linear Programming	3
IE 6773	Systems Simulation I	3
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6
At least two OR ISE courses		6
At least two non-OR ISE courses		6
At least one course from Computer Science (CSE), Mathematics (MA), or Statistics (ST)		3
Course to be selected by the student along with the academic advisor and graduate program committee		3
Total Hours		30

A thesis and an oral comprehensive examination in defense of the thesis are required.

Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

6. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Operations Research Concentration (OPRS) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 4613/6613

IE 6733	Linear Programming	3
IE 6773	Systems Simulation I	3
IE 9000	Thesis Research/ Thesis in Industrial Engineering	6
At least two OR ISE courses		6
At least two non-OR ISE courses		6
At least one course from Computer Science (CSE), Mathematics (MA), or Statistics (ST)		3
Course to be selected by the student along with the academic advisor and graduate program committee		3
Total Hours		30

A thesis and an oral comprehensive examination in defense of the thesis are required.

Additional requirements are:

5. A minimum of 12 hours coursework must be at the 8000-level or higher.
6. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
7. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
8. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Operations Research Concentration (OPRS) - Non-Thesis

Prerequisites (foundational courses) are:

Master of Science in Industrial Engineering with Operations Research Concentration (OPRS) - Non-Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 4613/6613

IE 6733	Linear Programming	3
IE 6773	Systems Simulation I	3
At least two Operations Research ISE courses		6
At least two non-Operations Research ISE courses		6
At least one course com Computer Science (CSE), Mathematics (MA), or Statistics (ST)		3
Courses to be selected by the student along with the academic advisor and graduate program committee		9
Total Hours		30

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE *8000* Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
2. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. *IE 9000 does not apply to M.S. students.*

Master of Science in Industrial Engineering with Data Analytics Concentration (DAAS) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 4613/6613

IE 6733	Linear Programming	3
IE 6773	Systems Simulation I	3
At least two Operations Research ISE courses		6
At least two non-Operations Research ISE courses		6
At least one course com Computer Science (CSE), Mathematics (MA), or Statistics (ST)		3
Courses to be selected by the student along with the academic advisor and graduate program committee		9
Total Hours		30

A written and oral comprehensive final exam on the coursework. At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE **9000** Research/Thesis does not apply to non-thesis students.

Additional requirements are:

4. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
5. No program can contain more than 15 hours of courses that are required in the bachelor's degree curriculum
6. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Data Analytics Concentration (DAAS) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 4613 Engineering Statistics 1
- MA 3113 Introduction to Linear Algebra

- MA 1723
- MA 2733
- MA 2743
- IE 4613 Engineering Statistics 1
- MA 3113 Introduction to Linear Algebra
- Computer Programming Proficiency

IE 6623	Engineering Statistics 2	3
IE 6683	Machine Learning with Industrial Engineering Applications	3
IE 8623	Adv Data Analytics	3
At least three ISE elective courses in Data Analytics. See academic advisor for list of approved electives.		9
At least one graduate class from CSE, ECE, or Math/Stat		3
Courses to be selected by the student along with the academic advisor and graduate program committee		3
IE 9000	Thesis in ISE	6
Total Hours		30

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Data Analytics Concentration (DAAS) – Non-Thesis

Prerequisites (foundational courses) are:
- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 4613 Engineering Statistics 1
- MA 3113 Introduction to Linear Algebra
- Computer Programming Proficiency

IE 6623	Engineering Statistics 2	3
IE 6683	Machine Learning with Industrial Engineering Applications	3
IE 8623	Adv Data Analytics	3
At least three ISE elective courses in Data Analytics. See academic advisor for list of approved electives.		9

- Computer Programming Proficiency

IE 6623	Engineering Statistics 2	3
IE 6683	Machine Learning with Industrial Engineering Applications	3
IE 8623	Adv Data Analytics	3
At least three ISE elective courses in Data Analytics. See academic advisor for list of approved electives.		9
At least one graduate class from CSE, ECE, or Math/Stat		3
Courses to be selected by the student along with the academic advisor and graduate program committee		3
IE 9000	Thesis in ISE	6
Total Hours		30

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree.

Master of Science in Industrial Engineering with Data Analytics Concentration (DAAS) – Non-Thesis

Prerequisites (foundational courses) are:
- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 4613 Engineering Statistics 1
- MA 3113 Introduction to Linear Algebra
- Computer Programming Proficiency

IE 6623	Engineering Statistics 2	3
IE 6683	Machine Learning with Industrial Engineering Applications	3
IE 8623	Adv Data Analytics	3
At least three ISE elective courses in Data Analytics. See academic advisor for list of approved electives.		9
At least one graduate class from CSE, ECE, or Math/Stat		3
Courses to be selected by the student along with the academic advisor and graduate program		9

At least one graduate class from CSE, ECE, or Math/Stat	3
Courses to be selected by the student along with the academic advisor and graduate program committee	9
Total Hours	30

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. *IE 9000 does not apply to M.S. students.*

committee	
Total Hours	30

A written and oral comprehensive final exam on the coursework. At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration.

CURRENT CURRICULUM OUTLINE	Required Hours
See above section – Concentration Description and Curriculum Outline/hours are now combined in the Graduate Catalog; therefore, outline is not repeated here.	

PROPOSED CURRICULUM OUTLINE	Required Hours
With the proposed degree name change, all concentration requirements and curricula will remain unchanged.	

3. Justification and Student Learning Outcome
The proposed changes will keep our program in line with our peer schools' programs and students' choices of coursework. The proposed changes have already been initiated and approved by the graduate school. ISE complied with those initiatives in this proposed revision.

4. Support
The change was approved by Industrial and Systems Engineering as indicated in the attached letter of support.

5. Proposed 3-Letter Abbreviation
The abbreviation for the ISE will not change.

6. Effective Date
August 16, 2024

MISSISSIPPI STATE UNIVERSITY
JAMES WORTH BAGLEY COLLEGE OF ENGINEERING

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Mohammad Marufuzzaman, Ph.D.
maruf@ise.msstate.edu

April 16, 2024

University Committee on Courses and Curricula
Mailstop: 9702
Mississippi State, MS 39762

Dear UCCC,

The Industrial and Systems Engineering (ISE) department discussed the proposal for the following changes to the M.S. degree program.

1. For the Human Factors and Ergonomics (HFE) "non-thesis" concentration, we propose to change the degree requirements of "At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above" to "At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above."

2. For the Industrial Systems (SYS) "non-thesis" concentration, we propose to change the degree requirements of "At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above" to "At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above."

3. For the Management Systems Engineering (MGTS) "non-thesis" concentration, we propose to change the degree requirements of "At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above" to "At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above."

4. For the Manufacturing Systems (MFGS) "non-thesis" concentration, we propose to change the degree requirements of "At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above" to "At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above."

5. For the Operations Research (OPRS) "non-thesis" concentration, we propose to change the degree requirements of "At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above" to "At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above."

6. For the Data Analytics (DAAS) "non-thesis" concentration, we propose to change the degree requirements of "At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above" to "At least **12** hours for the M.S. non-thesis degree must be from 8000-level courses or above."

MISSISSIPPI STATE UNIVERSITY™
JAMES WORTH BAGLEY COLLEGE OF ENGINEERING

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Mohammad Marufuzzaman, Ph.D.
maruf@ise.msstate.edu

The proposed changes will keep our program in line with our peer schools' programs and students' choices of coursework. The proposed changes have already been initiated and approved by the graduate school. ISE complied with those initiatives in this proposed revision. After some discussion, we put this proposal to the ISE Graduate Committee for a vote. The committee members are unanimously in favor of making these changes.

Sincerely,

Mohammad Marufuzzaman

Digitally signed by Mohammad Marufuzzaman
Date: 2024.04.16 12:41:14 -05'00'

Mohammad Marufuzzaman, Ph.D.
Associate Professor and Graduate Coordinator
Industrial and Systems Engineering

MISSISSIPPI STATE UNIVERSITY™
JAMES WORTH BAGLEY COLLEGE OF ENGINEERING

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Mohammad Marufuzzaman, Ph.D.
maruf@ise.msstate.edu

Approved:	**Signature and Date:**
Adam Piper, Ph.D.	Adam Piper Digitally signed by Adam Piper Date: 2024.04.16 13:40:23 -05'00'
Haifeng Wang, Ph.D.	Haifeng Wang Digitally signed by Haifeng Wang Date: 2024.04.16 13:15:34 -05'00'
Nazanin Morshedlou, Ph.D.	Nazanin Tajik Digitally signed by Nazanin Tajik Date: 2024.04.16 13:45:01 -05'00'
Seunghan Lee, Ph.D.	Seunghan Lee Digitally signed by Seunghan Lee Date: 2024.04.16 13:04:06 -05'00'
Mohammad Marufuzzaman, Ph.D.	Mohammad Marufuzzaman Digitally signed by Mohammad Marufuzzaman Date: 2024.04.16 12:41:32 -05'00'