NOT FOR USE FOR CURRICULAR COURSE CHANGES
REQUEST FOR PROGRAM IMPROVEMENTS

NOTE: Changes to programs may require course changes, which must be processed electronically. Any questions should be directed to Associate Provost David Reinhold at 7-4554 or david.reinhold@wmich.edu

DEPARTMENT: Chemical and Paper Engineering
PROPOSED EFFECTIVE FALL YEAR: 2020

PROPOSED IMPROVEMENTS: Academic Program Proposed Improvements

☐ New degree*
☐ New major*
☐ New curriculum*
☐ New concentration*
☐ New certificate*
☐ New minor*
☐ Deletion*
☐ Revised major
☐ Revised minor
☐ Admission requirements
☐ Graduation requirements
☐ Change in Title
☐ Transfer

☐ Other (explain)**

** Other:

Title of degree, curriculum, major, minor, concentration, or certificate: Master of Science in Engineering (Chemical)

Chair, Department Curriculum Committee: [Signature] Date 9/27/2019

CHECKLIST FOR DEPARTMENT CHAIRS/DIRECTORS

☐ For new programs and other changes that have resource implications, the dean has been consulted.
☐ When appropriate, letters of support from department faculty are attached.
☒ When appropriate, letters of support from other departments in the same college are attached.
☐ When appropriate, letters of support from other college deans, whose programs/courses may be affected by the change, are attached.
☐ The proposal has been reviewed by HIGE for possible implications for international student enrollment.
☒ The proposal is consistent with the departmental assessment plan, and identifies measurable learning outcomes for assessment.
☐ Detailed resource plan is attached where appropriate.
☒ All questions attached have been completed and supporting documents are attached.
☒ The proposal is written and complete as outlined in the Faculty Senate guidelines and the curriculum change guides.

Chair/Director: [Signature] Date 9/30/2019

CHECKLIST FOR COLLEGE CURRICULUM COMMITTEE

☐ The academic quality of the proposal and the faculty involved has been reviewed.
☐ Detailed resource plan is attached where appropriate.
☐ Consistency between the proposal and the relevant catalog language has been confirmed.
☐ The proposal has been reviewed for effect on students transferring from Michigan community colleges. Detailed information on transfer articulation must be included with undergraduate proposals.
☐ Consistency between the proposal and the College and department assessment plans has been confirmed.
☐ Consistency between the proposal and the College and department strategic plans has been confirmed.
☐ All questions attached have been completed and supporting documents are attached.
☐ The proposal is written and complete as outlined in the Faculty Senate guidelines and the curriculum change guides.

Chair, College Curriculum Committee: Date

Revised Sept. 2018. All previous forms are obsolete and should not be used.
NOT FOR USE FOR CURRICULAR COURSE CHANGES
REQUEST FOR PROGRAM IMPROVEMENTS

CHECKLIST FOR COLLEGE DEANS

☐ For new programs and proposed program deletions, the provost has been consulted.
☐ For new programs, letter of support from University Libraries Dean indicating library resource requirements have been met.
☐ When appropriate, letters of support from other college faculty and/or chairs are attached.
☐ When appropriate, letters of support from other college deans, whose programs/courses may be affected by the change, are attached.
☐ The proposal has been reviewed for implications for accreditation, certification, or licensure.
☐ Detailed resource plan is attached where appropriate.
☐ All questions attached have been completed and supporting documents are attached.
☐ The proposal is written and complete as outlined in the Faculty Senate guidelines and the curriculum change guides.

Dean: ___________________________ Date: ____________

FOR PROPOSALS REQUIRING REVIEW BY:
GSC/USC; EPGC, GRADUATE COLLEGE, and/or FACULTY SENATE EXECUTIVE BOARD

☐ Return to Dean
☐ Forward to: Curriculum Manager: ___________________________ Date: ____________

☐ Approve ☐ Disapprove *needs review by Chair, GSC/USC: ___________________________

☐ Approve ☐ Disapprove Chair, EPGC: ___________________________ Date: ____________

☐ Approve ☐ Disapprove Graduate College Dean: ___________________________ Date: ____________

☐ Approve ☐ Disapprove Faculty Senate President: ___________________________ Date: ____________

☐ Approve ☐ Disapprove Provost: ___________________________ Date: ____________

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1. Explain briefly and clearly the proposed improvement:

The Masters of Science in Engineering (Chemical) Program has been modified in three main ways:

a. The credit requirement for non-thesis students has been dropped from 33 credits to 30 credits. Thesis students currently have a 30 credit requirement and this is not changed.
b. EM 6140 has been added as an alternative course to CHEG 6500 in fulfilling course requirements for non-thesis students.
c. Electives have been modified to reflect changes in course offerings.

2. Rationale. Give your reason(s) for the proposed improvement.

a. The credit requirement for non-thesis students has been modified to bring this requirement closer to the credit requirement for thesis students at 30 credits.
b. CHEG 6500 has not been offered in several years. EM 6140 has been added as an alternative course to fulfill this requirement for non-thesis students.

3. Effect on other colleges, departments, or programs. If consultation with others is required, attach evidence of consultation and support. If objections have been raised, document the resolution. Demonstrate that the program you propose is not a duplication of an existing one.

EM 6140 is offered as an alternative to CHEG 6500 as a required course for non-thesis students. Supporting documentation is attached.

4. Effect on your department’s programs. Show how the proposed change fits with other departmental offerings.

No change is expected with other departmental offerings. This change may result in an increase in registered non-thesis students and a potential shift from thesis to non-thesis students with the adjustment in non-thesis required credits.

5. Alignment with college’s and department’s strategic plan, mission, and vision.

No change.

6. Effects on enrolled students: Are program conflicts avoided? Will your proposal make it easier or harder for students to meet graduation requirements? Can students complete the program in a reasonable time? Show that you have considered scheduling needs and demands on students' time.

No change.

7. Student or external market demand. What is your anticipated student audience? What evidence of student or market demand or need exists? What is the estimated enrollment? What other factors make your proposal beneficial to students?

These changes will help non-thesis students as the credit requirement is adjusted lower to bring this requirement closer to the credit requirement for thesis students.

8. Effects on resources. Explain how your proposal would affect department and University resources, including faculty, equipment, space, technology, and library holdings. If proposing a new program, include a letter and/or email of support from the university libraries affirming that the library resource issues have been reviewed. Tell how you will staff additions to the program. If more advising will be needed, how will you provide for it? What will be the initial one-time costs and the ongoing base-funding costs for the proposed program? (Attach additional pages, as necessary.)

There may be moderate increases in demand for the non-thesis degree option. These are not anticipated to increase beyond current departmental capacities.

9. List the learning outcomes for the revised or proposed major, minor, or concentration. The department will use these outcomes for future assessments of the program.

Not applicable.

10. Describe how this change is a response to assessment outcomes that are part of a department or college assessment plan or informal assessment activities.

Not applicable.

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11. (Undergraduate proposals only) Describe in detail how this change affects transfer articulation for Michigan community colleges. For new majors or minors, describe transfer guidelines to be developed with Michigan community colleges. For revisions to majors or minors, describe necessary revisions to Michigan community college guidelines. Department chairs should seek assistance from college advising directors or from the admissions office in completing this section.

Not applicable.

12. Please offer both “Current Catalog Language” and “Proposed Catalog Language” if there is to be a change in the catalog description for a given program. For the “current” language, please copy and paste relevant language from the most current catalog and for the “proposed” language, please share the exact proposed new catalog language. As possible, bold or otherwise note the key changes in the new proposed catalog language.

See attached.
Jim;

I checked with Betsy Aller who teaches this course. It is okay with her. Please proceed. Thanks for checking and asking us. Tim

Timothy J. Greene, Ph.D.
Professor of Industrial and Entrepreneurial Engineering and Engineering Management
Western Michigan University

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Hi Tim,

I hope that your week is starting off well.

Our department is planning on adding EM 6140 as an alternative course to CHEG 6500 as part of the requirements for non-thesis Masters students in Chemical Engineering. This course has been routinely substituted in for the last 3-4 years by these students as CHEG 6500 has not been consistently offered. This is usually about 3-5 students per semester.

I am emailing to ask for your support of this change in our requirements. Thanks, please let me know if you have questions and if you approve of this change on behalf of your department.

Jim

James R. Springstead, PhD
Associate Professor, Graduate Advisor, Western Michigan University Chemical Engineering
Assistant Professor, WMed Biomedical Sciences and Medical Engineering

4601 Campus Drive
A-222 Floyd Hall
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Phone: 269-276-3513
Master of Science in Engineering (Chemical)

Advisor: James Springstead  
Room A-222 Floyd Hall

The Master of Science in Engineering (Chemical) is designed to provide theoretical and laboratory experiences which are basic to the development of professional competence. A Thesis Option and a Non-thesis Option are available. While the program requirements for each option differ, the admission requirements for both options are identical.

For those students selecting the non-thesis option, a design experience (not an industrial internship experience) resulting in the student producing a major written report is required. This requirement is fulfilled by successfully completing CHEG 6500 or EM 6140 [Project Management].

Thesis Option: 30 total credit hours are required for graduation. This includes 24 credits of coursework and six credits of research (CHEG 7000).

Non-Thesis Option: 30 total credit hours are required for graduation. All the credits are acquired through coursework, and will include CHEG 6500 or EM 6140.

Students must have at least one-half of their earned credit hours to be used towards a graduate degree at the 6000 level or higher. Students are responsible for completing any needed prerequisites before taking a course for graduate credit. A maximum of six credit hours of graduate course credits may be transferred from another institution.

Admission Requirements
A Bachelor of Science in Chemical Engineering or a related discipline from an accredited college or university is required. If an applicant does not have sufficient background in Chemical Engineering, the applicant would need to minimally take or have taken prerequisite courses noted below, and depending on the area of focus, additional courses as determined by the department graduate committee in their case. Prospective graduate students must take the GRE general exam.

International students must successfully complete the Test of English as a Foreign Language (TOEFL). Acceptable scores will be according to the Western Michigan University standard for admission to a graduate-level program.

As noted above, prospective graduate students without a sufficient background in chemical engineering will at a minimum need to have completed or must complete while in the MS in Engineering (Chemical) degree program at WMU the following courses or their equivalent, with a cumulative GPA of 3.00 or higher:

- CHEG 2960 - Material and Energy Balance Credits: 4 hours
- CHEG 3110 - Unit Operations in Chemical Engineering I Credits: 3 hours
- CHEG 3120 - Unit Operations in Chemical Engineering II Credits: 3 hours
- CHEG 4100 - Chemical Reaction Engineering Credits: 3 hours
- MATH 3740 - Differential Equations and Linear Algebra Credits: 4 hours
And either
- CHEG 3200 - Chemical Engineering Thermodynamics Credits: 3 hours
- OR
- CHEM 4300 - Physical Chemistry I Credits: 3 hours

Core Courses

All Chemical Engineering graduate students must complete the Core courses:
- CHEG 6100 - Chemical Engineering Thermodynamics Credits: 3 hours
- CHEG 6200 - Advanced Transport Processes Credits: 3 hours
- CHEG 6300 - Chemical Reaction Engineering Credits: 3 hours

In addition

To fulfill the mathematics requirement for the Core courses, students must select one of the following or an approved substitute course with graduate level mathematical content:
- CHEG 6000 - Chemical Engineering Mathematics Credits: 3 hours
- MATH 5740 - Advanced Differential Equations Credits: 3 hours
- ME 5600 - Engineering Analysis Credits: 3 hours
- ME 5610 - Finite Element Method Credits: 3 hours
- ME 5620 - Application of Numerical Methods in Engineering Credits: 3 hours

Any approved MATH 5000 or 6000 level course taken at the graduate level

Note:

Students, with permission of the departmental graduate committee, may replace one of the Core courses with an additional course from the list of Electives.

Elective Courses

Thesis option students will select a minimum of six credit hours of Electives from the list below. Non-thesis option students will select a minimum of nine credit hours of Elective courses (including CHEG 6500 or EM 6140) from the list below.
- CHEG5100 - Medical and Biomolecular Engineering Concepts Credits: 3 hours
- CHEG5250 - Sustainable Earth Resources Engineering Credits: 3 hours
- CHEG 5200 - Renewable Energy and Energy Storage Credits: 3 hours
- CHEG 5950 - Topics in Engineering Credits: 3 hours
- CHEG 6400 - Pollution Prevention Engineering Credits: 3 hours
- CHEG 6500 - Chemical Process Design and Analysis I Credits: 3 hours
- CHEG 6510 - Chemical Process Design and Analysis II Credits: 3 hours
- CHEG 6600 - Methods of Research and Engineering Communication Credits: 3 hours
- CHEG 6950 - Graduate Topics in Chemical Engineering Credits: 3 hours
Cognate Courses

Depending on a student's personal interests, and with permission of the department graduate committee, students will select six credit hours of academic courses (not internships) at the 5000 or 6000 level. These courses are intended to give a student necessary tools to succeed as a chemical engineering professional, and to broaden their academic background. Courses should be of a type that could be taken by any graduate student enrolled at WMU, and do not necessarily have to be scientific or engineering based.

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