PROGRAM MODIFICATION PROPOSAL
College: [Engineering and Computer Science] **Department: [Mechanical Engineering]**

1. **Program:** *(e.g. B.S. in …., Option in …..)* **[MS in Mechanical Engineering]**

2. **Nature of Request:** (*Check all that apply*)
   [ ] Delete Program
   [X] Change Program Requirements with No Change in Total Units in Program
   [ ] Increase Total Units in Program (**From**: **[ ]** **To**: **[ ])**
   [ ] Decrease Total Units in Program (**From**: **[ ]** **To**: **[ ])**
   [ ] Change Total Units to Degree (**From**: **[ ]** **To**: **[ ])**
   [ ] Change in GE Requirements *(Describe Below)*
   [ ]
   [ ] Other: *(Describe below)*
   [ ]

3. **Date of Proposed Implementation**: **(Semester/Year)**: **[Fall] / [2016]** *Comments*

4. **Brief Summary of the Proposed Program Modification:** *(Insert below)*
   [Removal of two course ME 560 and ME 562 from the list of courses available in the program, addition of a new course ME 593, and title revision for ME 532. **]**

5. **Catalog Entry:** *(Attach current and proposed catalog copy)*

Current Catalog Copy

Only relevant sections are included, and the items to be modified are highlighted.

D. Required Courses

The number of required units depends on the number of "Expected Background" courses taken previously as part of a B.S. degree program and whether the thesis or comprehensive examination plan is chosen. Any "Expected Background" courses not taken are required in the M.S. degree program. The "Prerequisites" courses or their equivalents are required if they have not been taken previously, but they do not count as part of the M.S. program. Students interested in this program who do not have an undergraduate degree in Mechanical Engineering should contact the graduate coordinator regarding prerequisite requirements.

1. Required Core Courses (15-18 units)
Select one of the following:
ME 501A Seminar in Engineering Analysis I (3)
ME 501B Seminar in Engineering Analysis II (3)*
*Students in the Thermofluids Emphasis should take ME 501B.
Select one of the following:
AE 697 Direct Comprehensive Studies (3)
AE 698 Thesis (6)
ME 697 Direct Comprehensive Studies (3)
ME 698 Thesis (6)
Select at least one course from three of the four emphasis groups shown below.

Students may select appropriate experimental or special topics courses in an emphasis that are not shown on the list below with the approval of their advisor and the graduate coordinator.

2. Electives (12-18 units)

The number of required units of elective courses depends on the number of units of required courses described above. The total number of units in the M.S. degree program, both required and elective, must be at least 30 (33

with the comprehensive examination option). Students are expected to have the prerequisite courses listed below upon admission to the program. If they do not have these courses (or appropriate transfer courses), they will have to take the courses when they enter the M.S. program. Since these prerequisite courses are all 300-level courses, they carry no credit toward the M.S. degree.

The courses listed below as "Expected Background" also must be completed as part of the M.S. degree program if students have not already taken them (or appropriate transfer courses) as part of their undergraduate degree. Students can take a maximum of 6 units (thesis option) or 9 units (exam option) of 400-level courses as part of their M.S. degree program. The 400-level courses in the "expected background" list, which are taken as part of the M.S. degree program, will be part of this 6- or 9-unit maximum. The elective courses in the M.S. degree program are generally selected with the approval of an advisor to be consistent with the chosen emphasis. With the approval of an advisor, courses taken outside of the department are eligible for graduate credit. The elective courses in the M.S. degree program are normally chosen from the "Suggested Electives" for each emphasis.

a. Aerospace Emphasis

Prerequisites: ME 309, 370, 375, 390

Expected Background

AE 472 Aeropropulsion Systems (3)
AE 480 Fundamentals of Aerospace Engineering (3)
AE 589 Aerodynamics (3)

Suggested Electives

AE 572 Rocket Propulsion (3)
AE 586 Aircraft Design (3)
AE 672 Advanced Topics in Aero-Propulsion (3)
AE 680 Flight Vehicle Performance (3)
AE 689 Advanced Aerodynamics (3)

b. Mechanical Systems Design Emphasis

Prerequisites: ME 309, 330, 370, 375, 384, 390

Expected Background

AM 410 Vibration Analysis (3)
ME 415 Kinematics of Mechanisms (3)
ME 430 Machine Design Applications (3)

Suggested Electives

ME 409/L Fundamentals of Computer-Aided Mechanical Engineering and Lab (2/1)
ME 515 Dynamics of Machinery (3)
ME 531 Mechanical Design with Composites (3)
ME 532 Mechanical Design with Polymers (3)
ME 560 Automotive Engineering (3)
ME 562 Internal Combustion Engines (3)
ME 630 Computer-Aided Design of Machinery (3)
ME 686A Advanced Modeling, Analysis and Optimization I (3)
ME 686B Advanced Modeling, Analysis and Optimization II (3)

c. System Dynamics and Controls Emphasis

Prerequisites: ME 309, 330, 370, 375, 384, 390

Expected Background

AM 410 Vibration Analysis (3)
ME 415 Kinematics of Mechanisms (3)
ME 484 Control of Mechanical Systems (3)

Suggested Electives

ME 501B Seminar in Engineering Analysis II (3)
ME 503 Biomedical Instrumentation (3)
ME 520 Robot Mechanics and Control (3)
ME 522 Autonomous Intelligent Vehicle (3)
ME 584 Modeling and Simulation of Dynamic Systems (3)
ME 684 Design and Control of Dynamic Systems (3)

d. Thermofluid Systems Emphasis

Prerequisites: ME 309, 370, 375, 390

Expected Background

ME 470 Thermodynamics II (3)
ME 490 Fluid Dynamics (3)
ME 575 Applied Heat and Mass Transfer (3)

Suggested Electives

ME 483 Solar, Wind and Geothermal Energy (3)
ME 485 Introduction to Environmental Engineering (3)
ME 493 Hydraulics (3)
ME 501B Seminar in Engineering Analysis II (3)
ME 573 Chemical Reaction Engineering (3)
ME 583 Thermal-Fluids System Design (3)
ME 590 Advanced Fluid Dynamics (3)
ME 670 Advanced Topics in Thermodynamics (3)
ME 675A Conductive and Radiative Heat Transfer (3)
ME 675B Convective Heat and Mass Transfer (3)
ME 678 Transport Phenomena (3)
ME 683 Energy Processes (3)
ME 692 Computational Fluid Dynamics (3)

Total Units Required for the M.S. Degree: 30-33

Proposed Catalog Copy

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ME 522 Autonomous Intelligent Vehicle (3)
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ME 483 Solar, Wind and Geothermal Energy (3)
ME 485 Introduction to Environmental Engineering (3)
ME 493 Hydraulics (3)
ME 501B Seminar in Engineering Analysis II (3)
ME 573 Chemical Reaction Engineering (3)
ME 583 Thermal-Fluids System Design (3)
ME 590 Advanced Fluid Dynamics (3)
ME 593 Compressible Flow (3)

ME 670 Advanced Topics in Thermodynamics (3)
ME 675A Conductive and Radiative Heat Transfer (3)
ME 675B Convective Heat and Mass Transfer (3)
ME 678 Transport Phenomena (3)
ME 683 Energy Processes (3)
ME 692 Computational Fluid Dynamics (3)

Total Units Required for the M.S. Degree: 30-33

6. Justification for Request: *(Attach)*

The two courses (ME 560 and 562) were removed from the list of courses available to graduate students as they are practical courses aligned better our undergraduate program. They have been renamed ME 460 and 462. Moreover, a new course ME 593 was created and added to the list of available graduate courses. Lastly, the title of ME 532 was slightly revised to better reflect the topics covered in this course.

7. Estimate of Impact of Resources within Department, for other Departments and the University: *(Attach)*

8. Goals and Measurable Student Learning Outcomes for Program: *(Attach)*

9. Methods of Assessment for Measurable Student Learning Outcomes: *(Attach)*

A. Assessment Tools
B. Describe the procedure the dept/program will use to ensure the faculty will be involved in the assessment process. (Refer to the University's policy on assessment.)

10. Record of Consultation: *(Normally all consultation should be with a department chair or program coordinator. If more space is needed attach statement and supporting memoranda.)*

Date:	Dept/College:	Department Chair/Program Coordinator	Concur (Y/N)
[Spring2015]	[CECM/CECS]	[N. Dermendjian]	[Y]
[Spring2015]	[CS/CECS]	[R. Covington]	[Y]
[Spring2015]	[ECE/CECS]	[A. Amini]	[Y]
[Spring2015]	[MSEM/CECS]	[K. Chang]	[Y]
[Spring2015]	[ME/CECS]	[H. Johari]	[Y]
[ ]	[ ]	[ ]	[ ]

11. Approvals:

Department Chair/Program Coordinator:	Hamid Johari	Date:	[7/31/2015]
College (Dean or Associate Dean):	Robert Ryan	Date:	[7/31/2015]
Educational Policies Committee:		Date:	[ ]
Graduate Studies Committee:		Date:	[ ]
Provost:		Date:	[ ]