FAU
FLORIDA ATLANTIC UNIVERSITY

COLLEGE OF ENGINEERING & COMPUTER SCIENCE
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29th February 2012

Subject: Catalog Revisions for Mechanical Engineering Graduate Program

To: Dr. William Rhodes, Chair College Graduate Committee

From: Stewart Glegg, Chair OME Graduate Committee

On 2/28/12 the OME department faculty voted unanimously to revise the Mechanical Engineering Graduate program to include three core courses. This has required adding the core courses to each of the program option requirements given in the University catalog. In addition we have added detail by specifying the Mathematics courses that will be taken by the Masters Level students and re iterated the University requirements for number of courses required at the 6000 level and in the major area of study. We have also updated our requirements for the GRE, and deleted the ME Weekend program as requested by the Deans office. Finally we have added the requirement that the students pursuing the thesis option must submit a thesis proposal in their third semester of full time study (approved by the OME faculty on 1/31/12). I am forwarding this request to the College graduate committee for their consideration.

Combined Programs

B.S.M.E. to M.S. Degree Program (Thesis Option)

Candidates seeking a combined program leading to both Bachelor of Science in Mechanical Engineering and Master of Science degrees with the thesis option must complete an approved program of at least 30 credits. Out of those 30, 9 credits will count toward both the bachelor's and master's degrees.

~~Prerequisite Coursework for Transfer Students~~
~~Students transferring to Florida Atlantic University must complete both lower division requirements (including the requirements of the Intellectual Foundations Program) and requirements for the college and major. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the baccalaureate degree, students must also complete the prerequisite courses for their major as outlined in the *Transfer Student Manual* (see www.fau.edu/registrar/tsm.php).~~

~~All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.~~

Degree Requirements
Candidates must complete the following:

1. Three core courses (9 credits):
   EGM 6533 Advanced Strength of Materials
   EML 6715 Fluid Dynamics 1
   EML 6223 Mechanical Vibration or EML 6930 Control

2. A Math course (3 credits): either MAP 4306 Engineering Mathematics 2 or EOC 5172 Ocean Engineering Math 1
~~1. Four courses (12) credits at the 5000 or 6000 level from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section;~~

~~2. Math course of 4000 level (3 credits) or equivalent, approved by advisor;~~

3. Four technical electives (12~~9~~ credits). Two courses may be at the 4000 level or higher.

4. ~~and one additional 5000- or 6000-level~~ Up to three courses may be taken while the student is an undergraduate ~~course may be taken while the student is an undergraduate~~;

4. Before the end of the students third semester of full time enrollment a written thesis proposal must be submitted to the supervisory committee and defended in an oral examination.

5~~4~~. A master's thesis (6 credits), which must be defended at an oral examination.

6. At least one-half of the credits must be at the 6000-level or above.

7. At least one-half of the credits must be from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

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B.S.M.E. to M.S. Degree Program (Non-Thesis Option)

Candidates seeking a combined program leading to both Bachelor of Science in Mechanical Engineering and Master of Science degrees with the non-thesis option must complete an approved program of at least 33 credits. Out of those 33, 9 credits will count toward both the bachelor's and master's degrees.

~~Prerequisite Coursework for Transfer Students~~
~~Students transferring to Florida Atlantic University must complete both lower-division requirements (including the requirements of the Intellectual Foundations Program) and requirements for the college and major. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the baccalaureate degree, students must also complete the prerequisite courses for their major as outlined in the *Transfer Student Manual* (see www.fau.edu/registrar/tsm.php).~~

~~All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.~~

Degree Requirements
Candidates must complete the following:

1. Three core courses (9 credits):
   EGM 6533 Advanced Strength of Materials
   EML 6715 Fluid Dynamics 1
   EML 6223 Mechanical Vibration or EML 6930 Control

2. A Math course (3 credits): either MAP 4306 Engineering Mathematics 2 or EOC 5172 Ocean Engineering Math 1
~~Five courses (15) credits at the 5000 or 6000 level from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section;~~

~~2. Math course of 4000 level (3 credits) or equivalent, approved by advisor;~~

3. Seven~~Five~~ technical electives (21~~15~~ credits). Two courses may be at the 4000 level.

4. Up to three courses may be taken while the student is an undergraduate ~~or higher and one additional 5000 or 6000 level course may be taken while the student is an undergraduate~~.

5. At the time of application for degree, students must submit a portfolio to their advisor consisting of four graduate projects from 11 courses in their program of study. The portfolio will be reviewed by the student's supervisory committee.

6. At least one-half of the credits must be at the 6000-level or above.

7. At least one-half of the credits must be from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

B.S.M.E. to M.S. Degree Program (Non-Thesis Option/Minor in Business)

Candidates seeking a combined program leading to both Bachelor of Science in Mechanical Engineering and Master of Science degrees with the non-thesis option and with a Minor in Business must complete an approved program of at least 36 credits. Out of those 36, 9 credits will count toward both the bachelor's and master's degrees.

~~**Prerequisite Coursework for Transfer Students**~~
~~**Students transferring to Florida Atlantic University must complete both lower-division requirements (including the requirements of the Intellectual Foundations Program) and requirements for the**~~

~~college and major. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the baccalaureate degree, students must also complete the prerequisite courses for their major as outlined in the *Transfer Student Manual* (see www.fau.edu/registrar/tsm.php).~~

~~All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.~~

Degree Requirements
Candidates must complete the following:

1. Three core courses (9 credits):
   EGM 6533 Advanced Strength of Materials
   EML 6715 Fluid Dynamics 1
   EML 6223 Mechanical Vibration or EML 6930 Control

2. A Math course (3 credits): either MAP 4306 Engineering Mathematics 2 or EOC 5172 Ocean Engineering Math 1

3. Three technical elective~~Six~~ courses (9 credits~~18) credits~~ at the 5000 or 6000 level from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

4. ~~Nine credits~~Up to three courses may be taken while the student is an undergraduate;

5~~3~~. Five business courses (15 credits) as described at the beginning of this College of Engineering and Computer Science section.

6~~4~~. At the time of application for degree, students must submit a portfolio to their advisor consisting of four graduate projects from 12 courses in their program of study. The portfolio will be reviewed by the student's supervisory committee.

7. At least one-half of the credits must be at the 6000-level or above.

8. At least one-half of the credits must be from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

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Master's Programs

The Master of Science program has both thesis and non-thesis options. The thesis option requires a minimum of 24 credits of coursework and a thesis (6 additional credits). The non-thesis option requires a minimum of 33 credits of coursework. Requirements for the Ph.D. program are described later in this section.

Each student must complete a comprehensive and coordinated Plan of Study requiring depth in one or more of the following areas: mechanical systems, solid body mechanics, fluid mechanics, heat transfer, thermal/fluid systems, helicopter dynamics, materials, manufacturing, controls, robotics and CAD/CAM.

Admission Requirements
Usual admission requirements are as follows. Students with non-engineering bachelor's degrees, click here for additional requirements.

1. A baccalaureate degree in Engineering, Natural Science or Mathematics, but preferably in Mechanical Engineering and from a regionally accredited institution. A student who does not have a background in mechanical engineering should expect to take additional undergraduate mechanical engineering coursework.

2. Demonstrated proficiency in both written and spoken English. A student from a non-English-speaking country is required to take the Test of English as a Foreign Language (TOEFL) exam and achieve a score of at least 550 (CBT-213, iBT-79).

3. At least a 3.0 (of a 4.0 maximum) GPA in the last 60 credits attempted prior to graduation.

4. A score of 145 or higher on the verbal and 150 or higher on the quantitative portions of the Graduate Record Examination (GRE) or a combined score of 1000 or higher on the verbal and quantitative portions of the Graduate Record Examination (GRE) taken prior to Fall 2011. GRE scores more than five years old will not be accepted.

5. Petitions for admittance to the program will not be accepted when a student wishes to include more than five courses taken as a non-degree-seeking student.

Admission to Candidacy
A student is eligible to apply for candidacy when:

1. The student has completed a minimum of 9 credits as a graduate student.

2. The student has maintained a minimum GPA of 3.0 in all courses attempted as a graduate student.

3. The student has filed an approved Plan of Study for the degree program.

Students should file for candidacy as soon as they are eligible. Usually, no more than 20 credits of completed work before admission to candidacy will be accepted toward a degree program. A student should be admitted to candidacy prior to beginning work on thesis.

Degree Requirements
Students must satisfy all of the University graduate requirements.

Link to Master of Science with Major in Mechanical Engineering
Non-thesis Option and Non-thesis Option with a Minor in Business

Link to Master of Science with Major in Mechanical Engineering and Minor in Engineering Management

Link to Master of Science with Major in Mechanical Engineering
and Minor in Engineering Management—Weekend Program

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Master of Science with Major in Mechanical Engineering (Thesis Option)

Candidates for the Master of Science degree with the thesis option must complete an approved program of at least 30 credits including:

1. Three core courses (9 credits):
   EGM 6533 Advanced Strength of Materials
   EML 6715 Fluid Dynamics 1
   EML 6223 Mechanical Vibration or EML 6930 Control

2. A Math course (3 credits): either MAP 4306 Engineering Mathematics 2 or EOC 5172 Ocean Engineering Math 1

~~Four courses (12 credits) at the 5000 or 6000 level from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section;~~

~~2. Math course of 4000 level (3 credits) or equivalent, approved by advisor. Students are advised to take this course in the first semester of their graduate programs;~~

3. ~~Three~~ Four technical electives (12~~9~~ credits); two courses may be at the 4000 level ~~or higher and one additional 5000- or 6000-level course.~~

4. Before the end of the students third semester of full time enrollment a written thesis proposal must be submitted to the supervisory committee and defended in an oral examination.

5~~4~~. A Master's thesis (6 credits), which must be defended at an oral examination.

6. At least one-half of the credits must be at the 6000-level or above.

7. At least one-half of the credits must be from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

Master of Science with Major in Mechanical Engineering
Non-Thesis Option and Non-Thesis Option with a Minor in Business

Candidates for the Master of Science degree with the non-thesis option must complete an approved program of at least 33 credits including:

1.~~1.~~ Three core courses (9 credits):
EGM 6533 Advanced Strength of Materials
EML 6715 Fluid Dynamics 1
EML 6223 Mechanical Vibration or EML 6930 Control

2. A Math course (3 credits): either MAP 4306 Engineering Mathematics 2 or EOC 5172 Ocean Engineering Math 1

~~Five courses (15 credits) at the 5000 or 6000 level from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section;~~

~~2. Math course of 4000 level (3 credits) or equivalent, approved by advisor. Students are advised to take this course in the first semester of their graduate programs;~~

3. ~~Five~~ Seven technical electives (21~~15~~ credits); two courses may be at the 4000 level or higher with the additional courses at the 5000- or 6000-level.

4. At the time of application for degree, students must submit a portfolio to their advisor consisting of four graduate projects from 11 courses in their program of study. The portfolio will be reviewed by the student's supervisory committee.

5. At least one-half of the credits must be at the 6000-level or above.

6. At least one-half of the credits must be from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

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Candidates for the Master of Science degree with the non-thesis option and a Minor in Business must complete an approved program of at least 36 credits including:

1. Three core courses (9 credits):

EGM 6533 Advanced Strength of Materials
EML 6715 Fluid Dynamics 1
EML 6223 Mechanical Vibration or EML 6930 Control

2. A Math course (3 credits): either MAP 4306 Engineering Mathematics 2 or EOC 5172 Ocean Engineering Math 1

3. Three technical elective courses (9 credits) at the 5000 or 6000 level from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

~~1. Six courses (18 credits) at the 5000 or 6000 level from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section;~~

~~2. Mathematical Physics (3 credits) or approved equivalent. Students are advised to take this course in the first semester of their graduate programs;~~

3. Five business courses (15 credits) as described at the beginning of this College of Engineering and Computer Science section under Minor in Business.

4. At the time of application for degree, students must submit a portfolio to their advisor consisting of four graduate projects from 12 courses in their program of study. The portfolio will be reviewed by the student's supervisory committee.

5. At least one-half of the credits must be at the 6000-level or above.

6. At least one-half of the credits must be from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

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Master of Science with Major in Mechanical Engineering and Minor in Engineering Management

This Master of Science degree program with a minor in Engineering Management is a 36-credit program consisting of advanced courses in mechanical engineering as well as courses in the College of Business. Candidates for this program should have an undergraduate degree in mechanical engineering with a minimum GPA of 3.0 and a score of 145 or higher on the verbal and 150 or higher on the quantitative portions of the Graduate Record Examination (GRE) or a combined score of 1000 or higher on the verbal and quantitative portions of the Graduate Record Examination (GRE) taken prior to Fall 2011. GRE scores more than five years old will not be accepted.~~a GRE score of 1000 or higher~~. Non-English-speaking candidates must have a minimum score of 550 on the TOFEL. Two reference letters and at least two years of professional experience are also required.

Candidates for the Master of Science degree with Minor in Engineering Management must complete an approved program of at least 36 credits including:

1. Three core courses (9 credits):
EGM 6533 Advanced Strength of Materials
EML 6715 Fluid Dynamics 1
EML 6223 Mechanical Vibration or EML 6930 Control

2. A Math course (3 credits): either MAP 4306 Engineering Mathematics 2 or EOC 5172 Ocean Engineering Math 1

3. Three elective courses (9 credits) from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section. One may be at 4000 level.

4. Three required management courses (9 credits).
MAN 6245 Organizational Behavior
MAN 6501 Operations Management
MAN 6526 Project Management

5. Two elective management courses (6 credits) from the following list:
BUL 4424 Business Law for Honors Students
MAN 4401 Labor Relations
MAN 4802 Introduction to Small Business – Entrepreneurship
MAN 6299 Entrepreneurship, Creativity and Innovation
MAN 6526 Project Management
MAN 6609 Cross-Cultural Management and Human Resources
MAN 6614 International Business Operations
MAN 6806 Entrepreneurial Consulting Project
MAN 6875 Seminar in Entrepreneurship/Venture Management
MAN 6937 Global Environment of Management

6. At the time of application for degree, students must submit a portfolio to their advisor consisting of four graduate projects from twelve courses in their program of study. The portfolio will be reviewed by the students supervisory committee.

7. At least one-half of the credits must be at the 6000-level or above.

8. At least one-half of the credits must be from the list of Mechanical Engineering courses shown in the Engineering and Computer Science Course Descriptions section.

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~~Master of Science with Major in Mechanical Engineering and Minor in Engineering Management—Weekend Program~~

~~This program is administered by the Department of Ocean and Mechanical Engineering through the Mechanical Engineering program. Faculty from both the College of Engineering and Computer Science and the College of Business participate in teaching and advising.~~

~~All students enrolled in the Weekend Master's Program are required to take 12 courses over a 13-month period. The Master of Science with Major in Mechanical Engineering and Minor in Engineering Management degree will be awarded upon successful completion of all 12 required courses.~~

~~Admission Requirements~~
~~1. A baccalaureate degree in engineering or comparable field;~~

~~2. Demonstrated proficiency in both written and spoken English. Non-English speaking candidates must have a minimum score of 550 on the TOFEL or iBT (79-80), CBT (213), PBT (550);~~

~~3. A combined score of 1000 or higher on the verbal and quantitative portions of the GRE and a 3.0 GPA.~~

~~Curriculum Plan~~
~~The curriculum consists of the following two groups of courses: Mechanical Engineering Courses (21 credits) and Management Courses (15 credits). Course descriptions are listed under the respective programs in the catalog.~~

~~Engineering Core Courses (21 credits):~~		
~~Industrial Automation~~	~~EIN 5603C~~	~~3~~
~~Manufacturing Systems~~	~~EIN 6392~~	~~3~~
~~Special Topics~~	~~EML 6930~~	~~3~~
~~Inspection, Quality Control and Reliability~~	~~ESI 6222~~	~~3~~
~~Design of Experiments and Regression~~	~~ESI 6247~~	~~3~~

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~~Operations Research for Engineers~~	~~ESI 6306~~	~~3~~
~~Modeling of Manufacturing Systems~~	~~ESI 6524~~	~~3~~

~~Link to descriptions of Management Core courses.~~

~~**Management Core Courses (15 credits):**~~		
~~Business Law 2~~	~~BUL 4422~~	~~3~~
~~Organizational Behavior~~	~~MAN 6245~~	~~3~~
~~Entrepreneurship, Creativity and Innovation~~	~~MAN 6299~~	~~3~~
~~Operations Management~~	~~MAN 6501~~	~~3~~
~~Project Management~~	~~MAN 6581~~	~~3~~

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Doctoral Program

Doctor of Philosophy with Major in Mechanical Engineering

The degree of Doctor of Philosophy with major in Mechanical Engineering is conferred by the University primarily in recognition of a demonstrated ability for independent and original research in the discipline. This ability must be supported by a comprehensive and coordinated plan of advanced study designed to provide a strong background in the fundamentals of mechanical engineering and related areas.

Admission Requirements
Minimum requirements for admission to doctoral studies in mechanical engineering are as follows:

1. A baccalaureate in engineering or a related field from a recognized institution;

2. An average of "B" or better in the last 60 credits of work attempted;

3. A score of 145 or higher on the verbal and 150 or higher on the quantitative portions of the Graduate Record Examination (GRE) or a combined score of 1000 or higher on the verbal and quantitative portions of the Graduate Record Examination (GRE) taken prior to Fall 2011. GRE scores more than five years old will not be accepted.~~A combined score of 1000 or higher on the verbal and quantitative section of the Graduate Record Exam;~~

4. Demonstrated proficiency in both written and spoken English. A student from a non-English-speaking country is required to take the test of English as a Foreign Language (TOEFL) and achieve a score of at least 550 (CBT-213, iBT-79);

5. Three letters of reference attesting to the student's potential for graduate studies in mechanical engineering;

6. Approval for admission by the Department of Ocean and Mechanical Engineering. Usually, an applicant admitted will have a strong record of achievement that exceeds the minimum requirements. It is anticipated almost every applicant will already have a master's degree, but it is not an absolute requirement. Approval for admission by the department will be based on an evaluation of the student's record in terms of likelihood of success in the Ph.D. program.

Admission to doctoral studies does not constitute admission to candidacy for the degree.

Admission to Doctoral Status
Admission to doctoral status is granted after students have:

1. Successfully completed the department's Qualifying Examination;

2. Been accepted by a department faculty member willing to serve as their dissertation advisor;

3. Had their plan of coursework approved by their advisor, by the department graduate coordinator and by the Graduate College.

Admission to Candidacy
Admission to candidacy requires formulation of a supervisory committee approved by the department graduate coordinator as well as successful completion of the Qualifying Examination.

Degree Requirements
A central requirement for the Ph.D. degree in Mechanical Engineering is submission and defense of a dissertation based upon original research in an area of specialization acceptable to the student's supervisory committee. The completed dissertation must be approved by the committee, the department chair and the Graduate College. Additional requirements are:

1. A minimum of 51~~60~~ credits of coursework beyond the baccalaureate degree, or 21 credits beyond the master of science degree.

2. No more than 3 credits of directed independent study may be used to satisfy the minimum 21 credits of coursework.

3. A minimum of 12 credits must be in Mechanical Engineering courses, including the following three core courses:

EGM 6533 Advanced Strength of Materials
EML 6715 Fluid Dynamics 1
EML 6223 Mechanical Vibration or EML 6930 Control

4. Doctoral thesis research of not less than 33 credits.

5. Satisfaction of all University regulations and requirements for the Ph.D. degree.

Transfer Credits
A maximum of 12 credits beyond the master's degree can be transferred into the student's program of study.

Time Limits
No credit that is more than 10 years old at the time a graduate degree is awarded may be counted toward that degree at Florida Atlantic University. In addition, the final examination must be completed within five calendar years of the admission to candidacy, otherwise the Qualifying Examination must be repeated. (Change is effective spring 2012.)

Residency Requirement
Students are required to spend two semesters of full-time study beyond the master's degree in residence at Florida Atlantic University.