PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR/MINOR)

SUBMITTED BY:

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<tr>
<th>Department</th>
<th>College/School</th>
<th>CEM</th>
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<td>Petroleum Engineering</td>
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<tr>
<th>Prepared by</th>
<th>Phone</th>
<th>Faculty Contact</th>
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<tbody>
<tr>
<td>Shirish Patil</td>
<td>7748</td>
<td>Shirish Patil</td>
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Email Contact: ffslp

See http://www.uaf.edu/uafgov/faculty/cd for a complete description of the rules governing curriculum & course changes.

PROGRAM IDENTIFICATION:

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<th>DEGREE PROGRAM</th>
<th>Petroleum Engineering</th>
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Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.) BS

A. CHANGE IN DEGREE REQUIREMENTS: (Brief statement of program/degree changes and objectives)

This is a minor change in degree requirement. The proposed change will allow students to choose either MATH 310 (currently a required course) or ES301 (proposed alternative course). Total credits remain unchanged.

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

**Major — B.S. Degree**

1. Complete the general university requirements. (See page 124. As part of the core curriculum requirements, complete: MATH F200X, CHEM F105X and F106X, and LS F101X.)

2. Complete the B.S. degree requirements. (As part of the B.S. degree requirements, complete: MATH F201X, PHYS F211X and F212X.)

3. Complete the following program (major) requirements:*  
   ES F201—Computer Techniques—3 credits  
   ES F208—Mechanics—4 credits  
   ES F331—Mechanics of Materials—3 credits  
   ES F341—Fluid Mechanics—4 credits  
   ES F346—Basic Thermodynamics—3 credits  
   GE F261—General Geology for Engineers (3)  
   or GEOS F101X—The Dynamic Earth (4)—3 – 4 credits  
   GEOS F370—Sedimentary and Structural Geology for Petroleum Engineers—4 credits  
   PETE F103—Survey of Energy Industries—1 credit  
   PETE F104—Fundamentals of Petroleum—1 credit  
   PETE F205—Fundamentals of Drilling Practices—1 credit  
   PETE F206—Introduction to Petroleum Production—1 credit  
   PETE F301—Reservoir Rock and Fluid Properties—4 credits  
   PETE F302—Well Logging—3 credits  
   PETE F303W—Reservoir Rock and Fluid Properties Laboratory—1 credit  
   PETE F407—Petroleum Production Engineering—3 credits  
   PETE F411W—Drilling Fluids Laboratory—1 credit  
   PETE F421—Reservoir Characterization—3 credits  
   PETE F426—Drilling Engineering—3 credits  
   PETE F431—Natural Gas Engineering—2 credits  
   PETE F456—Petroleum Evaluation and Economic Decisions—3 credits  
   PETE F466—Petroleum Recovery Methods—3 credits
PETE F476—Petroleum Reservoir Engineering—3 credits
PETE F478—Well Test Analysis—2 credits
PETE F481W—Well Completions and Stimulation Design—3 credits
PETE F487A—Petroleum Project Design**—1 credit
PETE F487BW,O—Petroleum Project Design—1 credit
PETE F489—Reservoir Simulation—2 credits
Engineering elective***—3 credits
Technical elective****—3 credits

4. Complete the following program (major) requirements:
   MATH F202X—Calculus III—4 credits
   MATH F302—Differential Equations—3 credits
   MATH F310—Numerical Analysis—3 credits

5. Complete the Fundamentals of Engineering Exam (as approved by the Board of Architects,
   Engineers and Land Surveyors).

6. Minimum credits required—134 credits

* Student must earn a C grade or better in each course.
** PETE F487A is prerequisite for PETE F487B. Must take both courses to meet the oral communication and writing
   intensive requirements.
*** As approved by advisor (e.g. ME F416 or ES F307).
**** As approved by advisor (e.g. CE F603).

C. PROPOSED REQUIREMENTS AS IT WILL APPEAR IN THE CATALOG WITH THESE CHANGES:
(Underline new wording strike-through-old-wording and use complete catalog format)

Major — B.S. Degree

1. Complete the general university requirements. (See page 124. As part of the core
   curriculum requirements, complete: MATH F200X, CHEM F105X and F106X, and LS
   F101X.)

2. Complete the B.S. degree requirements. (As part of the B.S. degree requirements,
   complete: MATH F201X, PHYS F211X and F212X.)

3. Complete the following program (major) requirements:*
   ES F201—Computer Techniques—3 credits
   ES F208—Mechanics—4 credits
   ES F331—Mechanics of Materials—3 credits
   ES F341—Fluid Mechanics—4 credits
   ES F346—Basic Thermodynamics—3 credits
   GE F261—General Geology for Engineers (3)
   or GEOS F101X—The Dynamic Earth (4)—3 – 4 credits
   GEOS F370—Sedimentary and Structural Geology for Petroleum Engineers—4 credits
   PETE F103—Survey of Energy Industries—1 credit
   PETE F104—Fundamentals of Petroleum—1 credit
   PETE F205—Fundamentals of Drilling Practices—1 credit
   PETE F206—Introduction to Petroleum Production—1 credit
   PETE F301—Reservoir Rock and Fluid Properties—4 credits
   PETE F302—Well Logging—3 credits
   PETE F303W—Reservoir Rock and Fluid Properties Laboratory—1 credit
   PETE F407—Petroleum Production Engineering—3 credits
   PETE F411W—Drilling Fluids Laboratory—1 credit
   PETE F421—Reservoir Characterization—3 credits
   PETE F426—Drilling Engineering—3 credits
   PETE F431—Natural Gas Engineering—2 credits
PETE F456—Petroleum Evaluation and Economic Decisions—3 credits
PETE F466—Petroleum Recovery Methods—3 credits
PETE F476—Petroleum Reservoir Engineering—3 credits
PETE F478—Well Test Analysis—2 credits
PETE F481W—Well Completions and Stimulation Design—3 credits
PETE F487A—Petroleum Project Design**—1 credit
PETE F487BW, O—Petroleum Project Design—1 credit
PETE F489—Reservoir Simulation—2 credits
Engineering elective***—3 credits
Technical elective****—3 credits

4. Complete the following program (major) requirements:
   MATH F202X—Calculus III—4 credits
   MATH F302—Differential Equations—3 credits
   MATH F310—Numerical Analysis—3 credits or ES F301—Engineering Analysis—3 credits

5. Complete the Fundamentals of Engineering Exam (as approved by the Board of Architects, Engineers and Land Surveyors).

6. Minimum credits required—134 credits

* Student must earn a C grade or better in each course.
** PETE F487A is prerequisite for PETE F487B. Must take both courses to meet the oral communication and writing intensive requirements.
*** As approved by advisor (e.g. ME F416 or ES F307).
**** As approved by advisor (e.g. CE F603).

D. ESTIMATED IMPACT

**WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.**

NONE

E. IMPACTS ON PROGRAMS/DEPTS:

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

NONE

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

N/A – this is a minor change.
JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you drop a course, is it because the material is covered elsewhere? Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the program is not compromised as a result.

ES 301- Engineering Analysis covers linear algebra and Eigenvalue methods. ES 301 also introduces probability distribution functions (this is ~ 40% of what’s covered in ES 301). ES 301 uses the tools developed in linear algebra and statistical data modeling to develop methods to solve engineering problems. ES 301 also introduces many other methodologies (not based on linear algebra and statistics) to solve problems. ES 301 also includes a block of instruction on Model Optimization. Additionally, ES 301 introduces the use of Matlab both in its interactive environment and as a programming language to implement the modeling methods that are covered in class.

In short, ES 301 prepares the students to use mathematical tools to solve engineering problems as opposed to a pure mathematical course such as MATH 310- Numerical Analysis. Thus we would like to provide an option to PETE students to take either MATH 310 or ES 301 as part of the required curriculum to fill the 3- credits in Mathematics group as part of the GER.

APPROVALS:

Signature, Chair, Program/Department of: Shirish Patil, Petroleum Engineering

Date 7/28/08

Signature, Chair, College/School Curriculum Council for: Debu Misra, CEM

Date 10/13/08

Signature, Dean, College/School of: Doug Goering, CEM

Date 10/14/08

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair, UAF Faculty Senate Curriculum Review Committee

Date