PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR/MINOR)

SUBMITTED BY:

<table>
<thead>
<tr>
<th>Department</th>
<th>Electrical and Computer Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepared by</td>
<td>Charlie Mayer</td>
</tr>
<tr>
<td>Email Contact</td>
<td><a href="mailto:fcem@uaf.edu">fcem@uaf.edu</a></td>
</tr>
<tr>
<td>College/School</td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td>6091</td>
</tr>
<tr>
<td>Faculty Contact</td>
<td>Charlie Mayer</td>
</tr>
</tbody>
</table>

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

PROGRAM IDENTIFICATION:

<table>
<thead>
<tr>
<th>Degree Program</th>
<th>Electrical Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree Level</td>
<td>(i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.)</td>
</tr>
</tbody>
</table>

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

Change the degree requirements MSEE degree program to include the words "At least 26 credits must be at the F600-level." This is how it was listed in the 1998 graduate school catalog. Somehow the text "At least 26 credits must be at the F600-level" was left out of the degree program in subsequent years due to a typo in the catalog. This Format 5 is to formally return the degree requirements to what they were, what the department wishes them to be, and what the department has been following.

10-19-09: Number of credits is 24, not 26.

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

**Electrical Engineering**

College of Engineering and Mines
Department of Electrical and Computer Engineering
907-474-7137
[www.uaf.edu/cem/ece/](http://www.uaf.edu/cem/ece/)

**B.S., M.E.E., M.S. DEGREES**

**Minimum Requirements for Degrees:** M.E.E.: 32 credits; M.S.: 30 credits

The M.E.E. degree program, designed for the practicing professional engineer, focuses on a major project. The M.S. degree includes a written thesis and oral defense for those students interested in research and development. UAF offers an engineering Ph.D. program for students with an approved curriculum. Capable students with undergraduate degrees in physics, mathematics or related sciences, as well as in various branches of engineering, may also be admitted for graduate study. A student with adequate background can usually complete M.S. requirements within two academic years and a Ph.D. in another three academic years.

Graduate degree programs in electrical and computer engineering are closely connected with research activities of the faculty. The main areas of research include communications, radar, lidar and sonar remote sensing, instrumentation and microwave circuit design, electric power and energy systems, digital and computer engineering, nanotechnology, controls and robotics. Current research topics include high latency satellite communications, rocket telemetry, radio wave propagation, ultra wide band wireless communications, electromagnetic and acoustic wave propagation, remote biomedical and environmental instrumentation, microwave design, digital signal processing, digital and physical electronics, computer applications, remote hybrid electric power systems, electric power system design and analyses, electric power quality improvement, system identification, simulation, computer-controlled systems, control theory, robotics and
A number of on- and off-campus research facilities are available to students. Satellite, rocket and ground-based communication studies are carried out both on campus and at Poker Flat Research Range. The Sounding Rocket Laboratory provides opportunities for developing instrumentation for sounding rocket payloads launched from Poker Flat Research Range — the only university-operated rocket range in the world. The Arctic Region Supercomputing Center on campus provides a wide array of tools for digital system research. The department also has a variety of research laboratories available, including microwave, wireless communications, ultra wide band technology, waves, power electronics/robotics, instrumentation and digital laboratories.

Alaska's environment and remote location provide unique opportunities for research in a wide range of areas, such as the use of acoustic, light and radio wave techniques for measuring fish in Alaskan rivers to the geophysical properties of the aurora. Remote sensing for biomedical (animal tracking) and environmental (ground water and air monitoring) applications is an important research area for Alaska. Electric power systems research includes issues related to isolated rural Alaskan communities, analysis of larger interconnected generation, transmission and distribution systems serving major Alaskan population centers, and the use of alternative energy systems.

Graduate students in electrical and computer engineering at UAF receive the highest quality, contemporary education available at the graduate level and perform research appropriate to the technical needs of the state of Alaska, the nation and the world.

**Graduate Program — M.E.E. Degree**

1. Complete the following admission requirement:
   a. Submit GRE scores.

2. Complete one of the following admission requirements:
   a. Complete a bachelor's degree in electrical engineering.
   b. Students with bachelor's degrees in other fields should work out a program to address any background deficiencies with their graduate committee.

3. Complete the [general university requirements](#).

4. Complete the [master's degree requirements](#).

5. Complete 32 credits.*

6. Minimum credits required—32 credits

* At least 26 credits must be at the F600-level. A research project is not required, although up to 6 credit hours of research may be completed as part of the degree program. If a research project is part of the degree program, an oral project presentation and defense is required.

**Graduate Program — M.S. Degree**

1. Complete the following admission requirement:
   a. Submit GRE scores.

2. Complete one of the following admission requirements:
   a. Complete a bachelor's degree in electrical engineering.
   b. Students with bachelor's degrees in other fields should work out a program to address any background deficiencies with their graduate committee.

3. Complete the [general university requirements](#).
4. Complete the master's degree requirements.

5. Minimum credits required—30 credits
   See Engineering for Ph.D. program.

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)

Electrical Engineering

College of Engineering and Mines
Department of Electrical and Computer Engineering
907-474-7137
www.uaf.edu/cem/ece/

B.S., M.E.E., M.S. DEGREES

Minimum Requirements for Degrees: M.E.E.: 32 credits; M.S.: 30 credits

The M.E.E. degree program, designed for the practicing professional engineer, focuses on a major project. The M.S. degree includes a written thesis and oral defense for those students interested in research and development. UAF offers an engineering Ph.D. program for students with an approved curriculum. Capable students with undergraduate degrees in physics, mathematics or related sciences, as well as in various branches of engineering, may also be admitted for graduate study. A student with adequate background can usually complete M.S. requirements within two academic years and a Ph.D. in another three academic years.

Graduate degree programs in electrical and computer engineering are closely connected with research activities of the faculty. The main areas of research include communications, radar, lidar and sonar remote sensing, instrumentation and microwave circuit design, electric power and energy systems, digital and computer engineering, nanotechnology, controls and robotics. Current research topics include high latitude satellite communications, rocket telemetry, radio wave propagation, ultra wide band wireless communications, electromagnetic and acoustic wave propagation, remote biomedical and environmental instrumentation, microwave design, digital signal processing, digital and physical electronics, computer applications, remote hybrid electric power systems, electric power system design and analyses, electric power quality improvement, system identification, simulation, computer-controlled systems, control theory, robotics and automation.

A number of on- and off-campus research facilities are available to students. Satellite, rocket and ground-based communication studies are carried out both on campus and at Poker Flat Research Range. The Sounding Rocket Laboratory provides opportunities for developing instrumentation for sounding rocket payloads launched from Poker Flat Research Range — the only university-operated rocket range in the world. The Arctic Region Supercomputing Center on campus provides a wide array of tools for digital system research. The department also has a variety of research laboratories available, including microwave, wireless communications, ultra wide band technology, waves, power electronics/robotics, instrumentation and digital laboratories.

Alaska's environment and remote location provide unique opportunities for research in a wide range of areas, such as the use of acoustic, light and radio wave techniques for measuring fish in Alaskan rivers to the geophysical properties of the aurora. Remote sensing for biomedical (animal tracking) and environmental (ground water and air monitoring) applications is an important research area for Alaska. Electric power systems research includes issues related to isolated rural Alaskan communities, analysis of larger interconnected generation, transmission and distribution
systems serving major Alaskan population centers, and the use of alternative energy systems.

Graduate students in electrical and computer engineering at UAF receive the highest quality, contemporary education available at the graduate level and perform research appropriate to the technical needs of the state of Alaska, the nation and the world.

Graduate Program — M.E.E. Degree

1. Complete the following admission requirement:
   a. Submit GRE scores.

2. Complete one of the following admission requirements:
   a. Complete a bachelor's degree in electrical engineering.
   b. Students with bachelor's degrees in other fields should work out a program to address any background deficiencies with their graduate committee.

3. Complete the general university requirements.

4. Complete the master's degree requirements.

5. Complete 32 credits.*

6. Minimum credits required—32 credits

* At least 26 credits must be at the F600-level. A research project is not required, although up to 6 credit hours of research may be completed as part of the degree program. If a research project is part of the degree program, an oral project presentation and defense is required.

Graduate Program — M.S. Degree

1. Complete the following admission requirement:
   a. Submit GRE scores.

2. Complete one of the following admission requirements:
   a. Complete a bachelor's degree in electrical engineering.
   b. Students with bachelor's degrees in other fields should work out a program to address any background deficiencies with their graduate committee.

3. Complete the general university requirements.

4. Complete the master's degree requirements.

5. Minimum credits required—30 credits* — asterisk at #5, per Charlie Mayer on 10-19-09.

See Engineering for Ph.D. program.

* At least 24 credits must be at the F600-level.

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.)

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.

The quality of UAF education will be increased by requiring a higher percentage of graduate courses in the graduate degree program.

APPROVALS:

Signature, Chair, Program/Department of: Charles S. Vannoy  
Date: 9/17/09  
[Signature, Chair, Program/Department of:] Electrical and Computer Engineering

Signature, Chair, College/School Curriculum Council for: Alekasmith Misra  
Date: 10/7/09  
[Signature, Chair, College/School Curriculum Council for: CEM]

Signature, Dean, College/School of:  
Date: 10/8/09  
[Signature, Dean, College/School of: CEM]

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

Signature, Chair, UAF Faculty Senate Curriculum Review Committee  
Date