

**Graduate Executive Committee**  
**October 11, 2024**  
**Minutes**

**Attendees:**

**Voting Members:** Adham Atyabi, Amanda Elder, Carlos Diaz, Cerian Gibbes, James Van Scotter, Johanna Baez, Kara Holt, Lavonne Johnson, Lei Zhang, Leilani Feliciano, Pat Brady, Patrick McGuire, Patty Witkowsky, Robin Kempf, Steven Tragesser, Yang Wei

**Non – Voting Members:** Amy Rodas, Amy Sayer, Andrew Lac, Asjia Trotter, Bee Bish, Chris Beiswanger, David DuBois, Deanna Johnson, Hillary Fouts, Janel Owens, Jennifer Newcomb, Jose Mora, Katie Anderson-Pence, Kim Paine, Kristen Petersen, Kristina Ewald, Mary Rupp, Sam Adams, Sarah Long, Stephani Hosain, Stephanie Trujillo

Agenda Items:

- College of Engineering Proposal to Establish an Accelerated Master’s Program (AMP) between the Bachelor of Science and Master of Science in Aerospace Engineering (see proposal; Steve Tragesser)

GEC voted to recommend approval of the Proposal to Establish an Accelerated Master’s Program (AMP) between the Bachelor of Science and Master of Science in Aerospace Engineering (16 in favor, 0 against, 0 abstain)

- Discussion of Potential Updates to AMP Policy (Hillary Fouts)

Informational Items:

- Curriculum change for COB Grad Certificate and MBA emphasis in Space Cyber Enterprise Management to allow “SPMG 6000 Principles of Space Business” to be substituted for a new extended studies course “SPMG 6100 Space Cyber Industry Leader Professional Certification.”
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- Mountain Lion Research Day: December 6, 12-4pm in Gallogly Event Center
- Commencement: December 20
- Graduate School Spring Welcome Event: Tuesday, January 14<sup>th</sup> 5:30-7:30pm in **Kettle Creek**
- Mountain Lion Grad Slam (3-minute thesis competition)
  - Registration Deadline December 20
  - Preliminary Rounds January 28 and 29 in UC 302
  - Final Round Tuesday, February 4 at 3pm in Berger Hall

GEC Meetings for (Academic Year) all meetings are 2<sup>nd</sup> Friday of the month (when classes are in session) from 10:00-11:30

- Fall GEC Meetings: 11/8, 12/13
- Spring GEC Meetings: 2/14, 3/14, 4/11, 5/9

## **Proposal: Accelerated Master of Science in Aerospace Engineering**

The Accelerated Master's Program (AMP) in the Aerospace Engineering allows high-achieving students to pursue the Bachelor (BS) and Master of Science (MS) degrees in an accelerated manner. AMP is a combination of these two existing programs, but allows for 6 credits of graduate credits to count toward the requirements of both degrees. The program is essentially a recruiting tool that motivates students to stay and pursue their MS, which is beneficial to both the department and the career development of the student.

### **Program requirements**

The requirements for the combined AMP are the composite of the BS and MS degrees in Aerospace Engineering, but up to six credit hours of graduate level courses can count towards the requirements of the BS and also count toward the requirements of the MS, the latter of which is given below. The graduate courses that are taken prior to completion of the BS requirements serve as two of the four electives for the BS degree. These two graduate courses can serve as any of the requirements for the MS, but typically the Math requirements are encouraged since these are foundational.

One additional graduate course is permitted prior to the completion of the BS requirements (for 9 total credits hours) but this does not count toward the BS requirements.

### **Program justification**

This is a common program in engineering colleges across the country. University of Colorado Boulder has exactly the same program, called Bachelor's-Accelerated Masters (BAM), which also allows 6 credits of overlap between the two degrees.

The program encourages students to continue their education beyond the BS (they are already 20% of the way toward completion of the MS with the same number of credits as BS only students), which makes students much more marketable for employment. Only high performing students are allowed in the program ( $GPA > 3.25$ ) so that a) the student is more likely to succeed in taking graduate classes while still and undergraduate and b) the fewer number of total credit hours for the two credits has less of an impact on their competency.

### **Program costs**

There are no additional courses, faculty, or costs needed to implement this program. It is just an arrangement of existing courses and programs to encourage students to pursue the MS while still working on their BS. The graduate classes of the Mechanical and Aerospace Engineering department currently have plenty of capacity for the anticipated additional students, so additional sections will not need to be offered. In fact, we are very much in need of increasing our graduate enrollment both to make classes go and support our research mission. Thus, this program helps provide a necessary resource, supporting faculty rather than putting a drain on them.

### **Program admission and administration**

To participate in the Accelerated Master's Program, the student will fill out an "Intent application" while they are a full-time UCCS student in either the BS Mechanical Engineering or BS Aerospace Engineering Program. Students may apply for the program after they have completed a minimum of 30 credit hours of the mechanical or aerospace engineering core courses. The typical standard for acceptance into the program a cumulative G.P.A. of 3.25. After this application is accepted, the student can take up to nine credit hours of graduate classes as a BS student. Six credit hours of graduate coursework can be applied toward elective requirements for the BS, as well as toward graduation requirements for the MS. Up to three additional hours (nine hours total) can be transferred into the MS program.

After the BS requirements are completed, students in the AMP program will receive their BS degree. During the final semester of the BS, students will apply for the MS in the usual manner.

### **M.S. in Aerospace Engineering**

Students will choose between Plan I (Thesis Option), or Plan II (Course Option)

- Plan I - At least twenty-four credit hours of graduate coursework and up to six hours of thesis credit is necessary to satisfy the thirty credit hour requirement. The thesis credit will be provided for research, preparation of the thesis document, and defense of the thesis (which is required for completion of the program).
- Plan II - Thirty credit hours of graduate coursework.

### **Math Area**

All students must complete a minimum of two classes (6cr) in Math. Engineering Analysis I and II are encouraged for the first two semesters of the MSAE program, but the well-prepared student (with a recent BS in ME or AE) can choose any two of the following courses:

- Engineering Analysis I
- Engineering Analysis II
- Numerical Methods
- Machine Learning for Engineers
- Any graduate course with a MATH designation

### **Aerospace Engineering Courses**

Both plans will require completion of a minimum of at least five classes (15cr) specifically designated as Aerospace Topics courses (denoted below by \*). Up to two classes (6 cr) from the Space Operations program (SPCE prefix) may be used for the Aerospace Topics requirement with approval by the student's advisor and Chair of the MAE Graduate Affairs Committee. Up to 6 thesis credits on a topic in aerospace engineering can count toward the Aerospace Topics requirement with approval by the student's advisor and Chair of the MAE Graduate Affairs Committee.

### *Dynamics and Controls*

- Modeling and Analysis of Dynamic Systems
- Astrodynamics\*
- Trajectory Optimization\*
- Spacecraft Attitude Dynamics & Controls\*
- Digital Control
- Advanced Dynamics

### *Thermal Fluid Sciences*

- Intermediate Heat Transfer
- Incompressible Flow
- Advanced Thermodynamics
- Rocket Propulsion\*
- Combustion
- Radiation\*
- Space Environment\*
- Compressible Flow\*
- Multi-phase fluid mechanics
- Computation of Rare. Gas Dyn
- Computational Fluid Mechanics

### *Solid Mechanics*

- Mechanics of Materials
- Continuum Mechanics
- Constitutive Modeling