Minutes
Department of Aeronautics & Astronautics
May 11, 2015

Attending: Breidenthal, Bruckner, Dabiri, Ferrante, Holsapple, Jarboe, Kurosaka, Milroy, Morgansen, Shumlak, Yang, You, Waas; Gibbs, Maczko

Absent: Hermanson (sabbatical), Lin (sabbatical), Livne, Mesbahi, Narang, Slough, Vagners

MINUTES
Minutes of the April 2015 meeting will be voted on at the June faculty meeting.

ANNOUNCEMENTS
• Summer work approval – faculty who intend to work full-time for more than 2.5 months between 6/16 – 9/15 need to request approval from Prof. Waas first and then submit an online form to the College. An email listing the steps will be sent out.
• The A&A Spring Banquet is this Friday, May 15th.
• The department has hired Julie Taylor as a Budget/Fiscal Analyst. She will be responsible for pre- and post-award support and will assume some of Dave Erickson’s other responsibilities when he retires in June.
• This year merit increases will likely be implemented in September. The timing of this depends upon the finalization of the State budget.
• A search committee for the Research Scientist/Engineer position has been formed. So for we have received approximately 63 resumes. The committee will select 10 and then par it down to 4 to bring for an interview.

REPORTS FROM STANDING COMMITTEES
None

No report from the following committees: Computer Committee, Faculty Search, Graduate Committee, Peer Evaluation Committee, Safety Committee, Undergraduate Committee, Aero/Astro Working Committees, Space Allocation Committee, Strategic Planning, AIAA, Sigma Gamma Tau, Boeing Professor Selection; Diversity; MAE-CMS Advisory; Space Systems Center; UWA; PSI Center; Accreditation; Educational Policy; COE EDGE/UWEO; COE Executive; Promotion & Tenure; College Council; Academic Conduct; Engineering Manufacturing; FAA Center of Excellence; GISE; Technical Japanese; Certification Program; Faculty Fellows; Faculty Senate

DISCUSSION AND VOTE ON MINOR IN A&A (Morgansen)
Please see attached documents.

VOTE:
To approve a minor in A&A
In favor: 11, Opposed: 1, Abstain: 1, Eligible: 18

Discussion:
The A&A minor has been approved by undergraduate committee.
The draft proposal requires all students in the minor be required to take 310 and 311. Take 301 or 302 or 331 or 332 beyond that.
Concerns raised included:
the fundamentals, including 210, and other classes already have a long waiting list. Enrollment in 210 will be increased to address this matter.
Junior classes may potentially have to go out of the building.
Would this degrade the education of our students if we make the classes any larger. All students would have to meet prerequisites of A&A courses. It will be up to the professors to keep the quality of the courses high.

Can minors repeat courses that they didn’t do well? University rules will dictate policy. There should be rules about what’s allowed to be able to continue in the program. A&A course perquisites will have to be met to enroll in courses. Continuation policy grade point is 2.0 for the quarter, 1.7 in any one course.

Will this be a competitive minor? No. According to University policy minors are not competitive. Seems to be heavy loaded on fluids courses. Needs to be evenly distributed between all disciplines.

MANDATORY PROMOTION AND TENURE
Assistant Professor Setthivoine You is up for mandatory promotion and tenure. The Chair will need assistance from the plasma faculty to get a list of reviewers together. The faculty will make their recommendation at the October faculty meeting.

NEW BUSINESS
None

ADJOURNED
Meeting adjourned at 5:09pm.
Minor in Aeronautics & Astronautics
Minor in AA

Goals

– Increase training in AA without increasing enrollment in senior design
– Provide students with enough fundamental background that high achieving students would be prepared for graduate courses
– Increase non-AA student enrollment in upper-division AA courses (ABB)
– Support of multidisciplinary education
UW minor requirements

University of Washington minors must meet the following guidelines to be considered for approval:

•  25-35 credits.
•  A minimum of 50% or 15 credits, whichever is greater, of 300/400 level courses.
•  A student cannot receive a minor in their major.
•  A minimum of 50% or 15 credits, whichever is greater, must be completed in residence at the UW campus granting the minor.
•  Minors may request a minimum cumulative 2.0 GPA for courses applied to the minor; higher grade and GPA requirements are subject to additional review.
•  Courses taken Satisfactory/Not Satisfactory will not be counted toward a minor.
•  Students must declare a major and have completed a minimum of 45 credits before declaring a minor.
•  Students must have the major advisor sign off on minor declaration paperwork in order to ensure that students meet university satisfactory progress requirements.

http://depts.washington.edu/registra/curriculum/FCASpolicies.php
Minor in AA

- **Required courses (6 courses, 24 credits)**
  - AA210 (statics)
  - ME230 (dynamics, AA210)
  - AA260 (thermodynamics) (ME323 by permission)
  - CEE220 (mech. materials, AA210)
  - AA310 (space flight mechanics, ME230)
  - AA311 (atmospheric flight mechanics)

- **Electives (choose 2+ courses, 6+ cr, at least one AA course at 400 level, at least one in AA)**
- At least 50% of classes must be taken in AA department
- Substitutions by petition (e.g., fluids or thermodynamics)
- 2.0 grade in each class and 2.0 overall GPA

Total credits = 30-32 (or more)
Minor in AA - electives

Electives (choose 2+ courses, 6+ cr, at least one course at 400 level, at least one in AA)

- AA301 (compressible aerodynamics, AA260)
- AA302 (incompress aerodynamics, AA301, +)
- AA331 (structures I, CEE220)
- AA332 (structures II, AA331)
- AA360 (propulsion, AA301)
- AA400 (gas dynamics, AA260)
- AA402 (fluid mechanics, AA301, +)
- AA405 (intro space plasmas, Math324)
- AA419 (heat transfer, Math307)
- AA430 (finite element analysis, CEE220)
- AA432 (composite materials, AA332)
- AA440 (flight mechanics I)
- AA441 (flight test engineering, AA311, AA440)
- AA447 (classical control theory, AA312, ME230, M308)
- AA448 (control sys sensors & actuators, AA447)
- AA449 (special topics in controls, AA448)

- AA461 (advanced air propulsion, AA360)
- AA462 (rocket propulsion)
- AA470 (systems engineering)
- ESS471 (intro space physics, PHYS 123)
- ESS472 (rockets & instrumentation)
UWAA Minor

Engineering departmental requirements and overlap with AA minor required fundamentals

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General information

• No new courses need to be taught
• Junior lecture courses would need to move outside Guggenheim
• Increased advising needs
• Update catalog listings to indicate prereqs
• Must coordinate with ME and CEE
Engineering-related minors

Applied Mathematics
http://www.washington.edu/students/gencat/academic/amath.html

Minor Requirements: 27 or more credits as follows:
   i. MATH 124, MATH 125, MATH 126 or equivalent
   ii. Four applied mathematics courses at the 300 level or above (excluding AMATH 400, AMATH 498, AMATH 499)
   iii. Minimum 2.0 grade required in each course.

Atmospheric Sciences
http://www.washington.edu/students/gencat/academic/atms.html

Joint between Department of Atmospheric Sciences, Department of ESS and School of Oceanography

Minor Requirements: 25 credits to include ATM S 301 plus other approved courses. The minor may include a maximum of 6 independent study credits. Prerequisites include MATH 126 or MATH 136, and PHYS 123. Some courses may require further math or chemistry experience.

Other courses:
   i. Meteorology (42-45 credits)
      1. Core (33 credits): AMATH 301; ATM S 358, ATM S 441, ATM S 442, ATM S 444, ATM S 451, ATM S 452; CSE 142
      2. Advanced Mathematics (9-12 credits): MATH 324; either AMATH 351 and AMATH 353 or MATH 307, MATH 308, and MATH 309
   ii. Climate (39-49 credits)
      1. Core (27-29 credits): AMATH 301; ATM S 358, ATM S 380, ATM S 460, ATM S 487; CSE 142; either ESS 431 or ESS 433; either OCEAN 423 or OCEAN 450
      2. Electives (12-20 credits): minimum four courses from an approved list. See adviser for approved list of electives.
   iii. Chemistry (52-58 credits)
      1. Core (52-58 credits): ATM S 451, ATM S 458, ATM S 480; CHEM 142, CHEM 152, CHEM 162, CHEM 223, CHEM 224, CHEM 321
      2. Electives (12-18 credits): minimum four courses from an approved list. See adviser for approved list of electives.

Climate Science
http://www.washington.edu/students/gencat/academic/climatesci.html

Joint between Department of Atmospheric Sciences, Department of ESS and School of Oceanography

Minor in Climate Science: 25 credits as follows:
   1. One of ESS 201, ATM S 211, or ATM S 321 (3-5 credits)
   2. One of OCEAN 452/FISH 452, AMATH 301, Q SCI 381, or STAT 311 (3-5 credits)
   3. Integrated Capstone Experience: ATM S 475/ESS 475/OCEAN 475 (3 credits)
4. **Science Electives:** At least one course from each focus area to include at least one course each from ATM S, ESS, and OCEAN. See adviser for list of approved courses (minimum 12 credits)

5. **Policy Elective:** One social science, policy, or energy course from an approved list of electives, to reach 25 credits

6. Minimum 2.00 cumulative GPA in courses applied to the minor

7. Minimum 15 credits taken through the UW

8. Minimum 18 credits outside student's major

9. Minimum 15 upper division credits

10. **Note:** Students are encouraged to take MATH 124, MATH 125, MATH 126, PHYS 121, PHYS 122, and PHYS 123, or see adviser to complete requirements for the minor.

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**Earth and Space Sciences**

[http://www.washington.edu/students/gencat/academic/ess.html](http://www.washington.edu/students/gencat/academic/ess.html)

*Minor Requirements:* 30 ESS credits with at least 15 at the upper-division level (300- or 400-level) of which at least 3 credits must be at the 400-level (may not include independent study or seminar courses numbered ESS 489 through ESS 499.) All courses must be completed with a minimum grade of 2.0.

**Environmental Science and Terrestrial Resource Management**

[http://www.washington.edu/students/gencat/academic/sefs.html](http://www.washington.edu/students/gencat/academic/sefs.html)

School of Environmental and Forest Sciences

*Minor Requirements for Ecological Restoration:* 25 credits as follows:

i. *Introduction to Restoration Ecology (5 credits):* Either ESRM 362/ENVIR 362, BES 362, or TESC 362.

ii. *Capstone (10 credits):* One of the following sequences: ESRM 462/ENVIR 462, ESRM 463/ENVIR 463, ESRM 464/ENVIR 464; or BES 462, BES 463, BES 464; or TESC 462, TESC 463, TESC 464.

iii. *Electives:* 10 credits from approved list of electives maintained by each campus.

iv. Minimum 2.00 cumulative GPA for courses presented for the minor.

v. Minimum 15 credits from outside the student's major.

vi. Minimum 15 credits completed through the UW.

**Environmental Studies**

[http://www.washington.edu/students/gencat/academic/envir.html](http://www.washington.edu/students/gencat/academic/envir.html)

Program on the Environment

*Minor Requirements:* 30 credits, including ENVIR 100 and either ENVIR 200 or ENVIR 250. Five (5) credits from among ECON 235/ENVIR 235/ESRM 235, HSTAA 221/ENVIR 221, and PHIL 243/ENVIR 243. Remaining 15 credits drawn from the environmental perspectives course list (see program website or adviser for list). At least one course (minimum 3 credits) in each environmental perspectives course category, i.e., natural sciences, human and social dimensions, and policy and decision making. Ten (10) of these 15 credits must be at the 300 or 400 level.

Minimum 2.0 for each course presented for the minor.
History of Science
http://www.washington.edu/students/gencat/academic/hist.html

Department of History

Minor Requirements:  
History of Science: 25 credits, including HSTCMP 311, HSTCMP 312, HSTRY 390, and HSTRY 493; plus one course from an approved list of elective courses. A minimum 2.0 grade is required in each course.

Marine Biology
http://www.washington.edu/students/gencat/academic/marine_biology.html

Joint program between College of the Environment and College of Arts and Sciences

Minor Requirements: 35 credits, as follows:
1. Introductory Courses (18 credits): FISH 250/OCEAN 250/BIOL 250; OCEAN 210; BIOL 180; Q SCI 381.
2. Integrative Experience (3 credits): See adviser for approved list of courses.
3. Electives (14 credits): Selected from an approved list available from a program adviser. Additional courses may be approved by program adviser. (A minimum of one elective course must be taken from each of the following units: biology, aquatic and fisheries sciences, and oceanography.)
4. Up to 17 credits may overlap with credits applied to a student’s major and up to 5 credits may overlap with credits applied to another minor.
5. Minimum 15 credits in upper-division courses.
6. Minimum 2.00 cumulative GPA in courses presented for the minor.

Material Science and Engineering
http://www.washington.edu/students/gencat/academic/mse.html

Minor Requirements: 30 credits as follows: MSE 170, MSE 321, MSE 322, MSE 331, MSE 333, MSE 342, MSE 351, MSE 352, MSE 362. Minimum 2.0 grade of 2.0 required for each course.
The following courses serve as prerequisites for the departmental courses in the minor: MATH 124, MATH 125, MATH 126, MATH 307, and MATH 308 or MATH 318; CHEM 142 or CHEM 145, CHEM 152 or CHEM 155; PHYS 121, PHYS 122, PHYS 123; MSE 170; English composition. Students should take these courses before beginning the minor program.

Mathematics
http://www.washington.edu/students/gencat/academic/math.html

Minor requirements (minimum 30 credits):
1. Core (24-25 credits): MATH 124, MATH 125, MATH 126, MATH 307, MATH 308, and MATH 309; or MATH 134, MATH 135, and MATH 136 (25 credits, including 10 advanced-placement credits)
2. Electives (6 credits): mathematics courses numbered 301 or higher
3. At least 9 credits of courses numbered 301 or higher taken in residence through the UW. Minimum 2.0 grade required for each course offered as part of the minor.

Oceanography
http://www.washington.edu/students/gencat/academic/ocean.html

Minor Requirements: 25 credits as follows:
1. OCEAN 200, OCEAN 210, OCEAN 220
2. One of the following: OCEAN 400, OCEAN 410, OCEAN 420, or OCEAN 430
3. 12 credits of OCEAN electives, chosen from 300- and 400-level oceanography courses

Physics
http://www.washington.edu/students/gencat/academic/phys.html

Minor Requirements: 30-36 physics credits (in addition to 15 credits of MATH 124, MATH 125, and MATH 126) as follows:
1. Core courses: PHYS 121, PHYS 122, PHYS 123, PHYS 224, and PHYS 225
2. One of the following options:
   1. Physics Education: PHYS 407, PHYS 408, PHYS 409 (total 36 physics credits)
   2. Experimental Physics: PHYS 231, PHYS 334, and one course from PHYS 331, PHYS 335, PHYS 431, PHYS 432, PHYS 433, or PHYS 434 (total 30 physics credits)
   3. Mathematical Physics: PHYS 227, PHYS 228 (MATH 308 required), and one course from PHYS 321 or PHYS 324 (MATH 324 required) (total 30 physics credits)
3. Minimum grade of 2.0 required for each physics course counted toward the minor.

Quantitative Science
http://depts.washington.edu/cqs/students.html#minor

Joint between Environmental and Forest Sciences and Aquatic and Fishery Sciences

The minor requires a minimum of 27 credit hours as follows:

Core Courses (24-25 credits)
• Q Sci 291 and 292, Analysis for Biologists I and II (May substitute Math 124, 125), (10 credits)
• Q Sci 381, Introduction to Probability and Statistics, (5 credits)
• Q Sci 482, Statistical Inference in Applied Research I, (5 credits)
• Q Sci 483, Statistical Inference in Applied Research II, (5 credits) OR Q Sci 403/Stat 403, Resampling, (4 credits)

Electives (a minimum of 3 or more credits from an approved list)
• Partial approved list includes:
  ○ Q Sci/Envir 210, Intro to Environmental Modeling, (4 credits)
○ Q Sci/Stat 403, *Intro to Resampling Inference*, (4 credits) (if not taken as part of the core courses above)
○ Q Sci/Fish 454, *Ecological Modeling*, (4 credits)
○ Q Sci 480, *Sampling Theory*, (3 credits)
○ Q Sci 483, *Statistical Inference in Applied Research II*, (5 credits) (if not taken as part of the core courses above)
○ Q Sci 486, *Experimental Design*, (4 credits)

Additional courses may qualify at the discretion of the CQS Director.

*A minimum grade of 2.0 is required in all courses taken as part of the minor.*

**Statistics**

http://www.washington.edu/students/gencat/academic/stat.html

**Minor Requirements:** 26 credits, as follows:

1. **MATH 126** or MATH 136 (5 credits)
2. STAT 302, STAT 390/MATH 390, STAT 394/MATH 394, STAT 395/MATH 395 (13 credits)
3. either STAT 425/BIOST 425 or STAT 396/MATH 396 (3 credits)
4. Minimum 5 credits of approved electives. See adviser for approved list.
5. Minimum grade of 2.0 in each course used to satisfy minor requirements
6. At most 5 credits used to satisfy the statistics minor may be applied to a student’s major.
7. At least 20 credits used to satisfy the statistics minor must be taken through the UW.

Earth and Space Sciences BS requirements

**B.S. Requirements**

To complete the B.S., students take both the Core Courses and the courses listed under one of the Option Areas (*Geology*, *Biology*, *Physics* or *Environmental*). The following requirements are for students who declared their major beginning Autumn Quarter 2010.

**Core Courses**

- **Supporting Science (20 credits)**
  - CHEM 142
  - MATH 124, 125
  - PHYS 114/117 or 121 (Physics Option majors must take PHYS 121)
- **ESS Required Courses (15 credits)**
  Complete **three** of the following:
  - ESS 205 (counts as core course ONLY for Physics Option majors)
  - ESS 211
  - ESS 212
  - ESS 213

**ESS Option Areas**

- **Geology Option:** PDF and Word degree worksheets
  - Supporting Science (16-20 credits):
    - Math 126 or ESS 310
    - PHYS 115/118 or 122
    - **Two** of CHEM 152; MATH 307, 308; PHYS 116/119 or 123; STAT 311
  - ESS Required Courses (31 credits):
- Three of ESS 311, 312, 313, 314
- ESS 400
- ESS 418

- **ESS Electives (18-20 credits):**
  - ESS courses numbered 401-488
  - ESS 311, 312, 313, 314 not taken as a required course above

- **Biology Option: PDF and Word degree worksheets**
  - Supporting Science (25 credits):
    - CHEM 152, 162
    - BIOL 180, 200
    - One of Math 126; ESS 310; PHYS 115/118 or 122; BIOL 220; STAT 311
  - ESS Required Courses (31 credits):
    - Three of ESS 311, 312, 313, 314
    - ESS 400
    - ESS 418
  - ESS Electives (12 credits):
    - ESS courses numbered 401-488
    - ESS 311, 312, 313, 314 not taken as a required course above

- **Physics Option: PDF and Word degree worksheets**
  - Supporting Science (32-35 credits):
    - MATH 126, 308, 324 or MATH 136, 324
    - PHYS 122, 123, 227, 228, 321, 322
  - ESS Required Courses (14 credits):
    - Two of ESS 311, 312, 313, 314
    - ESS 418
  - ESS Electives (15-18 credits):
    - ESS courses numbered 400-488
    - ESS 311, 312, 313, 314 not taken as a required course above

- **Environmental Option: PDF and Word degree worksheets**
  - Supporting Science (10 credits):
    - CHEM 152 or 220
    - One of ESS 310; STAT 311; QSCI 381
  - ESS Required Courses (44-46 credits):
    - ESS 201
    - Two of ESS 311, 312, 313, 314
    - ESS 326
    - Two of ESS 315, 421, 426, 427, 454, 455, 456, 457, 459
    - ESS 400
    - ESS 418
  - ESS Electives (10 credits):
    - ESS courses numbered 401-488
    - ESS 311, 312, 313, 314 not taken as a required course above

**NOTE:** All courses COUNTED TOWARD THE MAJOR must be completed with a minimum grade of 2.0.

Apply to do a major in the ESS dept.
See other degrees offered by the ESS dept.