

ANNUAL REPORT FOR CSE DEAN/CHAIR MEETING, SUMMER 2016

DEPARTMENT

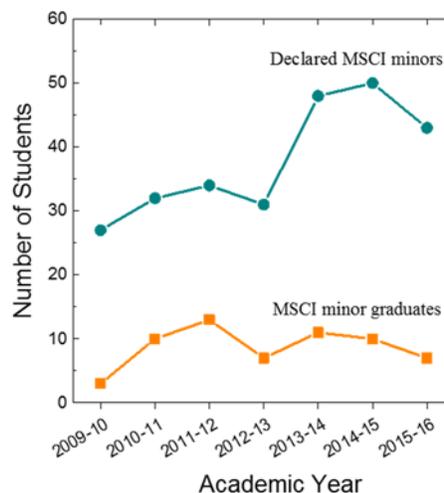
Advanced Materials Science  
and Engineering Center (AMSEC)

A. Program and Enrollment

For your responses in this section, data from *FactBook* will be very useful.

1. Comment on any significant increase or decrease in the department's number of declared majors and degrees granted. Do you have any concerns about increases or decreases registered in the data? If so, what plans do you have to address those concerns? What are the primary tools you utilize for your enrollment planning?

AMSEC does not offer a major degree, but does offer a materials science minor degree (MSCI minor). The MSCI minor is interdisciplinary in nature and draws students from six member departments, but principally from the Chemistry, Engineering and Physics Departments. Plotted in the figure below is the numbers of declared MSCI minors by academic year. As indicated by the enrollment data, the number of declared MSCI minors has been the range 40-50 students over the last three years, which reflects significant student interest in materials science. However, a concern in recent years has been the relatively low yield of MSCI minor graduates (7-10 per year) from this declared group of students. Based on student advising, a barrier identified to students finishing the MSCI minor has been the sequencing of courses. A number of students graduate with STEM degrees each spring and choose, therefore, to not complete the MSCI minor since MSCI 410 (the capstone Materials Characterization course) has been taught only in the fall term. To address this issue, AMSEC will alter the sequence by which MSCI courses are offered so that MSCI 410 is now taught each spring (instead of each fall) – see table below. During 2016-17, the transition academic year, MSCI 410 will be offered in both fall and spring to ensure that all currently declared MSCI minor students have the opportunity to take this capstone course on the expected timeline for their degree completion.



- **MSCI 201:** Introduction to Materials Science & Engineering (4 cr) – F, W, S
- **MSCI 321:** Materials Chemistry (1 cr) – F
- **MSCI 322:** Polymers & Composites (1 cr) – F
- **MSCI 323:** Semiconductor Materials & Devices (1 cr) – F
- **MSCI 330:** Introduction to Materials Science II (4 cr) – W
- **MSCI 410:** Materials Characterization (4 cr) – S

2. Comment on any trends or changes in SCH generation evidenced in the past three years, ending with AY 2015-16. Please consider overall SCH, but also the distribution of it across departments and programs, and across lower-division, upper-division, and any graduate program courses. Also, please comment on the distribution of SCH by NTT or TT/TN (do you anticipate changes to this distribution?).

The enrollment in MSCI courses has been relatively steady in recent years (8-11 students per course), but below our desired level of 12-16 students. With the restructuring of the MSCI course sequence, the conversion of Engineering Technology to Engineering now complete, and a number of new faculty joining AMSEC, we look forward to increased enrollment in the MSCI courses. The higher demands of the new Engineering major have led to fewer of these students completing the MSCI minor in the short-run, but this will hopefully change in coming years as more academically talented students are attracted to WWU's engineering program.

3. Note any significant changes in time-to-degree. To what do you attribute increases or decreases?

No significant change; AMSEC does not have any course bottlenecks at this time. Scheduling course meeting times for students drawn from multiple STEM majors continues to be a challenge, and Juliet Barnes works hard to satisfy the scheduling constraints of all MSCI minor students so as to not delay their completion of the minor degree.

4. Please describe any current curricular initiatives or outreach planning that might bring about program changes or enrollment impact. Include comments on trends and on any GUR planning, on-line curriculum, and international programming.

AMSEC will be reaching out to students in the CSE majors during 2016-17 to inform them of the opportunities in the materials science field and of the new sequencing of MSCI courses that will enable a more timely completion of the MSCI minor. AMSEC does not currently offer GUR, service or on-line courses, and is not envisioning international programming at this time.

## **B. Faculty Positions**

---

1. Please list your tenure-track faculty recruitment efforts during AY 2015-16.

AMSEC did not recruit any tenure-track faculty during the 2015-16 academic year, but two new CSE faculty (Sean Mulcahy - Geology, John Misasi - Engineering) applied for and were welcomed as new AMSEC faculty in spring 2016.

2. Please list plans for tenure-track faculty recruitment for AY 2016-17 and briefly describe funding scenarios (retirements, conversion of funds previously used for NTT sections, etc.)

AMSEC has no plans currently to recruit tenure-track faculty during the 2016-17 academic year, but new hires in CSE Departments may be suitable candidates for AMSEC membership.

**C. Faculty Professional Development**

---

Do you have a sense of how many faculty members in your college/ unit are planning on applying in fall of 2016 for professional leave in 2017-2018? If so, describe any anticipated numbers and planning issues.

Not applicable as faculty are affiliated with AMSEC, but are members of a CSE department.

**D. Scholarship**

---

1. Summarize faculty scholarship, as reflected in the Annual Activity Reports, during the past academic year. Include the number of students who are listed as authors (i.e., “30-6” would represent 30 articles, 6 of which have student authors listed).

Not applicable as faculty are affiliated with AMSEC, but are members of a CSE department and their scholarly productivity is tabulated at the departmental level.

Books	Refereed Journal Articles	Other Journal Articles	Book Chapters	Edited Volumes	Conference Papers	Exhibits (Posters)	Book Reviews	Recordings*	Presentations/Performances	Abstracts

*\* any product resulting from professional activity, such as programs and cd roms.*

2. Summarize student scholarship in the college (undergraduate or graduate), during the past academic year. Along with the faculty/student collaborations (included above), include the number of students who have produced scholarship independently (not included above).

To our knowledge, no students in the MSCI minor have produced independent scholarship during the 2015-16 academic year.

Books	Refereed Journal Articles	Other Journal Articles	Book Chapters	Edited Volumes	Conference Papers	Exhibits (Posters)	Book Reviews	Recordings*	Presentations/Performances	Abstracts

*\* any product resulting from professional activity, such as programs and cd roms.*

3. Please list any significant awards or honors your faculty or students have received during AY 2015-16 (not scholarships).

AMSEC faculty and staff received a number of significant awards during 2015-16:

- Staff Exceptional Effort Award - Juliet Barnes (AMSEC staff)
- Olscamp Outstanding Research Award - Bernie Housen (Geology faculty)
- Arlan Norman Award for Excellence in Student Mentoring – Sue DeBari (Geology faculty)
- Kaiser-Borsari Scholarship for Women in Materials Science – Zoe Pollard (Math major, MSCI minor)

4. If you collect it, please provide information here on your college's community service hours for AY 2015-16.

Date	Student/Community Group	Description of Outreach Event
June 26 - July 1, 2016	10-12 <sup>th</sup> graders	<i>College Quest:</i> "Introduction to Renewable Energy for Scientists and Engineers" - A week-long renewable energy class for high school students that includes lecture, lab and field trips to renewable energy businesses
Sept. 11-17	Incoming WWU freshmen	<i>Viking Launch:</i> "Introduction to the Science of Renewable Energy" - An opportunity for incoming freshmen to explore the science behind renewable energy as well as to acclimate to college life.
Oct. 20	5 <sup>th</sup> graders	<i>Compass 2 Campus:</i> "Wind, Water, Sun: Power Transformed" - Interactive discussions with 5 <sup>th</sup> graders about energy followed by hands-on renewable energy activities. Seven faculty and 6 students participated in AMSEC's C2C event this year.

### E. Grant Funding

For 2015-16, indicate external grant activity:

Faculty (name/role)	Grant Agency	Pending	Rejected	Received	Amount
PI Mark Peyron, co-PIs Tanveer Chawla, David Rider	WA State - Joint Center for Aerospace Technology and Innovation (JCATI)			X	\$99,538
PI Dave Rider, co-PIs Dave Patrick, Mark Bussell,	Murdock Charitable Trust			X	\$272,000
PI Amy Spivey (UPS), co-PIs Dave Patrick, Mark Bussell, Andrea Munro (PLU), Carlisle Chambers (GFU)	Murdock Charitable Trust			X	\$240,000 (WWU portion: \$86,400)
PI Dave Rider, co-PIs Dave Patrick, Mark Bussell,	National Science Foundation		X		---

## **F. External Fundraising**

---

1. Describe any fundraising initiatives and/or successes from the past year. Do you have plans for enhancing your fundraising in the future?

AMSEC did not have any fundraising initiatives during 2015-16 and the amount of funds raised was disappointing. We look forward to coordinating with the CSE Development and WWU Corporate Giving staff in coming years to develop a robust fundraising strategy for AMSEC.

While this doesn't formally fit in the fundraising category, AMSEC has forged/maintained a number of partnerships with regional companies in which our students, staff and faculty work with company personnel on research and development projects. In fiscal year 2016, AMSEC has engaged in nine projects with regional companies and organizations in projects with contracts totaling approximately \$7,000. A few of those partnerships are listed below:

- **TOKU-E Company**
  - NMR analyses of organic compounds
- **University of Washington**
  - TGA and DSC analyses of polymeric materials
- **PACCAR**
  - XPS of carbonaceous materials
- **Tidal Vision**
  - Testing of chitin and chitosan samples
- **Sampson Rope**
  - Testing of rope fibers and coatings

The income from these industry projects are distributed to the AMSEC member departments (and STS) whose instrumentation is used as well as to the students and faculty who work on the projects. Any residual funds are retained in AMSEC's self-sustaining account.

2. If your department has some sort of professional advisory board, please describe that group's work this year.

AMSEC does not currently have a professional advisory board.

## G. Resource Needs

---

In priority order, what are the department's top five resource needs? Include estimated cost and brief rationale.

	<b>Resource Need</b>	<b>Est. cost</b>	<i>Rationale</i>
1	Field-Emission - Scanning Electron Microscope (FE-SEM)	\$550,000	AMSEC and others on campus have a critical need for a FE-SEM for research and instruction. An instrument with nanometer resolution is needed, which requires a model having a field-emission source. The current SEM is outdated and a significant upgrade in capabilities is necessary.
	0.5 FTE Technical Staff (electron microscopy technician)	\$45,000	The optimal utilization and maintenance of a FE-SEM instrument would be best realized by an additional 0.5 FTE technician dedicated to this instrument.
2	High-throughput powder X-ray diffractometer	\$90,000	AMSEC has a number of key pieces of instrumentation that are bottlenecks for teaching and research. X-ray diffraction tops the list of needed expansion of instrumentation capacity. This new instrument would free-up the existing instrument for use in reflectivity and thin film measurements.
3	0.2 FTE Administrative Staff	\$10,000 per year	Additional administrative support is needed for the following: 1) Increased administrative work due to additional activities generated when new AMSEC instruments come online (growth in services for internal and external users will impact contract administration and financial management); 2) Increased AMSEC external grant portfolio that requires additional grant budgeting, purchasing and management; 3) Increased faculty and student needs necessitate additional staff time to continue and improve AMSEC administrative services.
4	Quartz crystal microbalance	\$8,000	A QCM instrument is needed for instruction and research involving the deposition and growth of thin film materials.
5	Transmission electron microscope	\$1,000,000	A long-term need for materials science education and research at WWU.

## H. Space

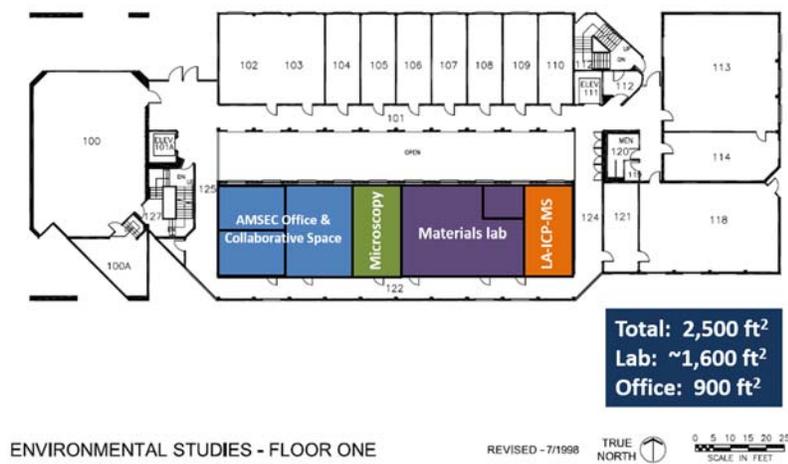
---

1. Please provide narrative comment here on your department's current space needs and pressures.

Below is a summary of the current AMSEC space in the Environmental Sciences Building and the proposed space allocation in the Environmental Sciences Building Renovation and Addition as described in WWU Pre-Design document currently under review. The process culminating with the Pre-Design document has been a frustrating one, marked by poor communication between the affected units (e.g. AMSEC, Geology) and the WWU staff having oversight for the design process.

- **Current AMSEC Space**

- ES 128-131: Remodeled in 2012, dedicated in 2014.
- Lab space: ~1600 sq ft
- Office/Meeting space: ~900 sq ft



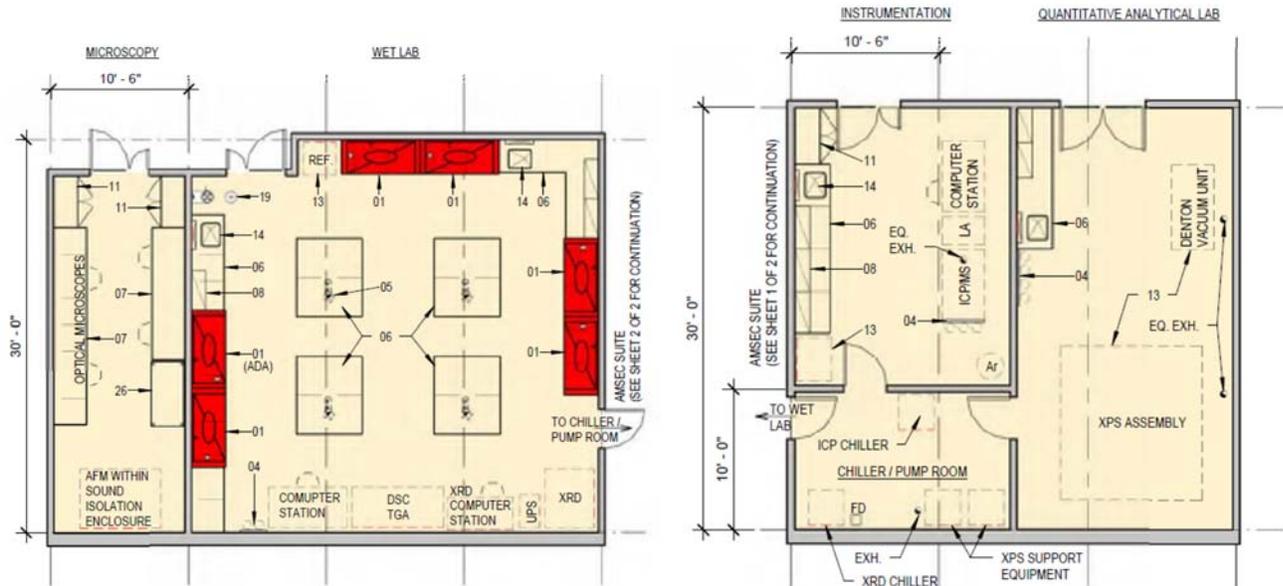
- **Advantages of current AMSEC space**

- High visibility, central location for member departments
- Co-location of lab and office spaces

- **Disadvantages of current AMSEC space**

- Some AMSEC instrumentation is located in borrowed space (XPS - CF 14 , thermal evaporator - CF 11)
- No optimal space for electron microscopy (SEM, TEM)

- **Proposed AMSEC Space**
  - Targeted space is in the ES building addition
  - Lab space: 2,205 sq ft, office space: 440 sq ft



- **Advantages of proposed space**
  - High quality lab spaces
  - New lab spaces for XPS system, thermal evaporator and electron microscopy
  - Only one move (into the addition)
  -
- **Potential Negative Impacts**
  - Disruption during the move
  - Loss of conference room and some office space
  - Possibility of a less visible location
  - Co-location of staff offices and lab spaces is critical

It is AMSEC's assessment that if the Pre-Design allocation for AMSEC is fulfilled **and** AMSEC staff offices are co-located with the laboratory facilities, then our space needs will be adequately met in the new ES Addition. For reasons of safety, student/faculty training on instrumentation as well as supervision of instrument usage and laboratory activities, it is critical that AMSEC staff offices be co-located with the lab facilities.

2. Describe any planned growth and new programs/initiatives potentially needing additional space.

In partnership with Scientific and Technical Services, AMSEC expects to provide funding (Murdock Grant) for a high-level, field emission scanning electron microscope (FE-SEM) that will need space in the ES or CF buildings prior to the construction of the ES Addition.

## **I. Budget**

---

Please provide narrative comment here on your department's budget. Include remarks on operating fund balances, self-sustaining funds, Foundation dollars, equipment, and any other accounts the department administers. Please attach any spreadsheets that would be helpful for discussion.

### **Operating Budget**

- AMSEC has one Operating Fund: FOMSEC (1 10200 3620 011ZAA) – the current balance (June 1, 2016) is approximately \$10,000.
- The annual operating budget amount was \$45,000 in FY2010, the year MSCI courses were first offered. The current annual budget is \$41,800. Starting with FY2011, AMSEC's operating budget was reduced by \$3,200.
- AMSEC has historically used operating funds to offset a substantial portion of lab consumables for MSCI 410 and lab courses of participating departments that use AMSEC instrumentation. Additionally, AMSEC's operating funds cover consumables for faculty and students who use AMSEC's shared instrumentation for research. Approximately 50% of the AMSEC operating budget is used for instrument support, repair and maintenance.

### **Self-Sustaining Funds**

- AMSEC has two Self-Sustaining Funds:  
FSSMMA (1 23272 3620 011AMS) = \$16,131(student lab fees and indirect cost return funds)  
FSSAMS (1-59177-3620-011ZAA) = \$12,676 (industry contract revenue)  
FSAMAS (1-23307-3620-011AMS) = \$2054 (analytical services)
- AMSEC has increased its student lab fee rates to offset consumable expenses for MSCI 410, 491 and 492. The MSCI 410 lab fee is currently \$94 (approx. 30-50% of consumable cost per student) and the lab fee for MSCI 491 and 492 is \$47.
- Annual Indirect Cost Recovery (ICR) funds have been in the \$5,000-\$6000 range for FY2014 – FY2016.

### **Foundation**

- AMSEC has one Foundation Fund: FFAMSC (2 240340 3620 SPTACD) = \$2,308.
  - AMSEC's expenditures this year include refreshments at AMSEC seminars and dinners with AMSEC seminar speakers. Fundraising for AMSEC continues to be a challenge as alumni tend to show allegiance to their major department when making donations.
-

-----

The following topics will be discussed at the Dean/Chair meeting.  
No written comments are required or requested.

**K. Staff**

---

What staff changes, challenges, accomplishments, and plans have occurred over the past year (in departments and/or the college office?)

**L. Faculty**

---

You should meet individually with each permanent faculty member prior to the Dean/Chair meeting. (See the Annual Faculty Review section of the COPEP.)

1. Review of plans for probationary faculty for performance leading to tenure. (This plan should be agreed upon by the Chair and faculty member and should be reflected in the annual non-tenured evaluation letter prepared by the Chair).
2. Review of each faculty member's accomplishments and plans for the future, as discussed by the Chair with each faculty member in the annual review meeting.
3. Review of faculty teaching loads, other assigned duties, and release time.
4. Review of non-tenure-track faculty.

**M. Chair**

---

1. Review of your role as chair: What are your major goals, accomplishments, challenges?