TO: Members of the Board of Trustees

FROM: President Sabah Randhawa on behalf of Brent Carbajal, Provost and Vice President for Academic Affairs and David Patrick, Interim Vice Provost for Research and Dean of the Graduate School

DATE: December 13, 2019

SUBJECT: Graduate Education & the Research Enterprise at Western

PURPOSE: Discussion Item

Purpose of Submittal:
In this interactive session, David Patrick, Interim Vice Provost for Research and Dean of the Graduate School, will present an overview of graduate education, research and sponsored programs at Western. Two graduate students will also speak to their experiences and be available to answer questions from Trustees.

Background:
Students in Western’s graduate programs pursue advanced studies in over 30 different fields, with opportunities in Bellingham, Seattle, south Puget Sound and online. Graduate education at Western produces leaders and professionals with specialized knowledge and skills prepared to contribute to society and the economy. Graduate programs also enhance the depth, rigor and intellectual vitality of the University, and are interwoven with undergraduate education, research and scholarship through a myriad of synergistic connections. Western’s portfolio of research and creative activities is one of the strongest among primarily undergraduate and Masters-granting institutions. These programs engage students in hands-on learning at all levels, while fostering innovation and providing regional access to expertise and specialized resources. This presentation will provide an overview of graduate education, research programs and infrastructure at Western, including discussion of strategic priorities.

Strategic Questions:
1. How do the Trustees view the roles of graduate education, research and scholarly programs in the context of Western’s strategic vision?

2. What should the footprint of graduate education at Western look like?

3. How can Western's research programs engage most effectively for regional and statewide impacts?
• 35 Masters degree programs
• 3 certificate programs
• 1 clinical doctorate program
• 700 – 750 enrolled students
• 275 – 300 degrees awarded per year
• 230 Graduate TA positions university-wide

Adult and Higher Education, Anthropology, Archives & Records Management, Biology, Chemistry, Clinical Doctorate Audiology, Computer Science, Creative Writing, Educational Administration, Educational Administration (Off-Campus), English Studies, Environmental Education, Environmental Education (Residency), Environmental Science, Environmental Studies, Exercise Science, Experimental Psychology, Geology, History, Language and Literacy, Marine and Estuarine Science (BIO), Marine and Estuarine Science (ES), Master in Teaching, Master in Teaching (Everett), Master of Business Admin. (PT, Evening), Master of Business Administration (Daytime), Master of Business Administration (Wknd, Everett), Master of Professional Accounting, Mathematics, Mental Health Counseling, Music, Rehabilitation Counseling, School Counselor, Speech and Language Pathology, Sport Psychology
Graduate Education

Masters Degrees Awarded 2019

- Education: 37%
- STEM: 43%
- Business: 10%
- Arts: 1%
- Humanities & Soc Sci: 9%

Masters Degrees Awarded By CGS Category

- WWU, 2019
- National Average, 2016

Nation-wide degree AY16-16 data from: https://nces.ed.gov/programs/digest/d17/tables/dt17_323.10.asp
Graduate Education

- 54% of applicants are WA residents
- 3% – 4% international
- 17% students of color
- 60% female

Cohort Demographics

- Female
- Non-White

Average Age of all applicants
Average Age of all admits
Average Age of all matric
91% of graduates are employed within six months
5% pursuing further education

Student success initiatives
- Need-based waivers
- Graduate writing studio
- Community-building events
- New student orientation programming
- Graduate Student Advocacy Council (GSAC)
Graduate Education

Impacts...

On Western
- Intellectual vitality
- Undergraduate teaching
- Mentors and role models
- Advanced coursework options
- New faculty recruitment

On Washington State
- Business & educational leadership
- Specialized workforce
- Innovation economy

On Students
- Career advancement
- First-job competitiveness
- Life-long learning
<table>
<thead>
<tr>
<th>Patent / Application</th>
<th>Status</th>
<th>Discipline</th>
<th>Student co-inventors?</th>
<th>Filing Date</th>
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<tbody>
<tr>
<td>Methods of growing molecular crystals</td>
<td>Pending</td>
<td>Chemistry</td>
<td>Yes</td>
<td>2019</td>
</tr>
<tr>
<td>BENZOXAZINE BLENDS</td>
<td>Pending</td>
<td>Chemistry</td>
<td>Yes</td>
<td>2019</td>
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<td>KITS FOR MAKING RECYCLABLE COVALENTLY CROSSLINKED POLYMER NETWORKS, RECYCLABLE COMPOSITES, AND RELATED METHODS OF MAKING RECYCLABLE COMPOSITES AND RECYCLING COMPOSITES</td>
<td>Pending</td>
<td>Engineering</td>
<td>No</td>
<td>2018</td>
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<td>Nanoscale nickel phosphide catalysts for hydrotreatment</td>
<td>Issued 10,406,509</td>
<td>Chemistry</td>
<td>No</td>
<td>2015</td>
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<tr>
<td>Use of marine algae for co-producing alkenones, alkenone derivatives, and co-products</td>
<td>Issued 10,208,321</td>
<td>Chemistry</td>
<td>No</td>
<td>2015</td>
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<tr>
<td>Photoluminescent semiconductor nanocrystal-based luminescent solar concentrators</td>
<td>Issued 9,964,680</td>
<td>Chemistry, Math</td>
<td>Yes</td>
<td>2013</td>
</tr>
<tr>
<td>Oriented fluorophores</td>
<td>Abandoned</td>
<td>Chemistry, Physics, Math</td>
<td>No</td>
<td>2013</td>
</tr>
</tbody>
</table>

Patent applications per 1000 employed scientists and engineers, 2017 (from NSF)

WA State 31/yr (5th nationally)
Graduate Education

Strategic priorities

- Fair and competitive TA stipend levels
- Increased student diversity
- Access in high demand fields
- Balanced academic coverage
- Reaching underserved populations
- Overall graduate enrollment

![Chart showing percent graduate enrollment for AY17-18]

- Percent Graduate Enrollment
  - UW: 30%
  - WSU: 20%
  - EWU: 10%
  - Evergreen: 5%
  - WWU: 6.5%
  - CWU: 0%

![Chart showing masters degrees awarded from 2005 to 2019]

- Number of degrees awarded over time
- Target = 375
- 2005: 350
- 2019: 264

![Chart showing percent of all WWU degrees from 2009 to 2019]

- Percent of all WWU Degrees
  - 2009: 9%
  - 2010: 8%
  - 2011: 7%
  - 2012: 6%
  - 2013: 5%
  - 2014: 4%
  - 2015: 5%
  - 2016: 6%
  - 2017: 7%
  - 2018: 8%
  - 2019: 9%

Strategic priorities

- Fair and competitive TA stipend levels
- Increased student diversity
- Access in high demand fields
- Balanced academic coverage
- Reaching underserved populations
- Overall graduate enrollment
Research and creative inquiry at Western
Extramural Funding

- Federal
- State
- Other

Yearly Funding Distribution from 2008 to 2018.
WWU ranks 338th nationally in Federal R&D spending

There are 418 doctoral institutions and 685 masters institutions in the US.

*Ph.D program / med school
Strategic priorities

- Strengthen research infrastructure
- Support junior faculty
- Diversify funding base
- Grow industry partnerships
- Compete for mid-scale grants
Foundation of scholarly programs

Research & performance space

Equipment & technical staff

Seed funding

Administrative support

High performance computing
Chromatography & mass spectrometry
Materials testing equipment
Imaging & microscopy
Microfabrication facilities
Engineering
Life Sciences
Materials Science
Environmental & Marine Science

Chromatography & mass spectrometry

Proteomics, Genomics, Molec. Biol.

Murdock Trust $319k
NSF $496k
WWU $60k

WWU $100k

$175k

University Instrument Center

GC-MS
Confocal microscope

Murdock Trust $325k

WWU $225k

JCDREAM $150k

Polarizing microscope

NSF $343k

NSF $300k

NSF $300k

Transmission electron microscope

Raman microscope

Light sheet microscope

Engineering
Life Sciences
Materials Science
Environmental & Marine Science

Imaging and Microscopy

William C. and Ruth Ann Dewel Microscopy Facility

Light Microscopy and Imaging Facility

Appalachian State University

James Madison University

NSF

Murdock Trust

WWU

JCDREAM

$325k

$225k

$150k

$343k

$300k

$300k