SHOW-ME **CHEMISTRY** THE **GROUP**

$$I = 0.5 \Sigma z_i^2 [S_i]$$

$$\mu_{cryst} = \Sigma \mu_{mol}$$

$$H\psi = E\psi$$

Chemistry of Anisotropic Media

Progressing on the Theory & Experiment Co-Evolutionary Spiral

Vitae | Contact | Students & Collaborators | Group News | MyLinks
Research | Publications | S&T Chemistry & Graduate Education
Teaching & STEM Education | Peer Review, Faculty Mentoring, and Consulting
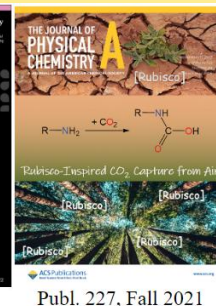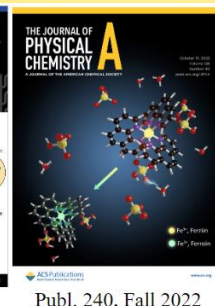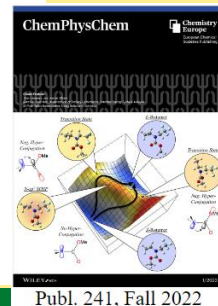
Graduate Education
grad.mst.edu

Dr. Rainer Glaser
FRSC, FAAAS, FACS, FAIC
Interim Vice Provost of Grad. Educ.
glaserr@mst.edu
glaserr.missouri.edu

ChemPhysChem — Publ. 241, Fall 2022
THE JOURNAL OF PHYSICAL CHEMISTRY A — Publ. 240, Fall 2022
ChemPlusChem — Publ. 239, Fall 2022
THE JOURNAL OF PHYSICAL CHEMISTRY A — Publ. 227, Fall 2021

MISSOURI S&T

Chancellor's Leadership Mtg., 01/31/23

S&T Graduate Education

- Graduate Students: By Colleges & Degrees, and how to increase numbers
- Increasing GS Numbers: Certificates, Grad Track Paths
- Supporting Graduate Students: Kummer I&E & "--------"
- Graduate Students' Bill of Rights: Foster Student-Centered Culture
- Graduate Student Success: Towards Centralized Graduate Education
- Active Recruiting: GS Travel Fund & Recruiting Visit Reimbursement
- Graduate Student Success: GE Events & Showcase; Technical Editing

🔊 cat·a·lyst

/ˈkad(ə)ləst/

noun

a substance that increases the rate of a chemical reaction without itself undergoing any permanent chemical change.
"chlorine acts as a catalyst promoting the breakdown of ozone"

- a person or thing that precipitates an event.
  "the governor's speech acted as a catalyst for debate"

Graduate Enrollment

	MS M	MS F	PhD M	PhD F	Total	Percent	Percent M
CASE	20	28	62	23	**133**	13.6	61.7
CEC	223	106	306	72	**707**	**72.2**	74.8
KUMMER	81	41	11	5	**138**	14.1	66.7
NON-Degree	0	1	0	0	**1**	0.1	
ON CAMPUS	**324**	**176**	**379**	**100**	**979**	100	
CASE	13	23	0	0	**36**	7.4	36.1
CEC	196	36	21	3	**256**	**52.9**	84.8
KUMMER	135	42	8	2	**187**	38.6	76.5
NON-Degree	5	0	0	0	**5**	1.0	
EXTENSION	**349**	**101**	**29**	**5**	**484**	100	
GRAND TOTAL	**673**	**277**	**408**	**105**	**1463**		73.9
MS					950	64.9	70.8
PhD					513	35.1	79.5

The three colleges are <u>very</u> different!!

One and the same policy for all three colleges does <u>not</u> work well to grow S&T overall.

Lots of work to reach gender equality!
55 > %(M) > 45

MS:PhD ≈ 2:1
MS:PhD ≈ 1:1 (campus, 😠)

S&T Graduate Education

MISSOURI S&T™

Graduate Enrollment

CASE	MS M	MS F	PhD M	PhD F	Total	Graduate Degrees	
CHEM	1	0	22	13	36	**PhD, MS**	Build MS Prog.!
MATH	7	2	21	5	35	**PhD, MS**	Build MS Prog.!
PHYSIC	1	0	19	5	25	**PhD, MS**	Build MS Prog.!
BIO SC	7	9	0	0	16	**MS**	PhD Prog. Proposed!
TCH COM	4	8	0	0	12	**MS**	PhD Prog. Planned.
PSYCH	0	9	0	0	9	**MS**	PhD Prog.?
EDUC	0	0	0	0	0		
ENGL	0	0	0	0	0		ENGAGE
ENV SCI	0	0	0	0	0		IN
HIST	0	0	0	0	0		INTERDISC.
MULTI	0	0	0	0	0		RESEARCH
PHIL	0	0	0	0	0		
Total	**20**	**28**	**62**	**23**	**133**		

The departments in CASE are <u>very</u> different!!

One and the same policy for the three classes of departments does <u>not</u> work well to grow CASE overall.

MS:PhD ≈ 1:2 🙂
50% of depts. are <u>w/o</u> Grad. Prog. 🤔

S&T Graduate Education

MISSOURI
S&T

Grad. Progs.: Quo Vadis?

More graduate students in depts. w/ high MS:PhD ratio
- ❖ High MS:PhD ratio is good for tuition income.
- ❖ High quality original research requires doctoral students.

More graduate students in depts. w/ low MS:PhD ratio
- ❖ Low MS:PhD ratio is good for high quality research.
- ❖ Depts. with strong PhD programs should develop their MS programs to increase tuition income.

Departments w/ MS Program: Lost Opportunity Cost
- ➢ MS Program enables participation in disciplinary and interdisciplinary research.
- ➢ Emphasis on creating PhD programs. *Focus of ongoing efforts to reach R1-target!*

Departments w/o Graduate Program: Huge Lost Opportunity Cost 🤔
- ➢ Faculty engagement in disciplinary and interdisciplinary research time-limited.
- ➢ Without graduate students, it is extremely hard to get into productive research.
- ➢ Highest emphasis should be on creating MS programs in departments w/o Graduate Programs.

Focus on reaching North Star Goal

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S&T Graduate Education

Grad. Stud. Funding

MAE 8
ECE 4
CArEE 3
GGPE 3
COMP SCI 3
NUC 2
MATH 2
CHEM 2
PHYS 1
MINING 1
CBE 1

Kummer I&E Fellowship (KIE), FS21-

- ❖ $30,000 annual fellowship support for up to <u>four</u> years plus program, travel etc.
- ❖ Buy-in from faculty for 1-4 years (beginning with FS23)
- ❖ 33 awarded so far. 10 more by FS23. >65% Intl. Students.
- ❖ Target to support ca. 50 in any given year.

Chancellor's Distinguished Fellowship (CDF), FS15-FS20

- ❖ $10,000 annual fellowship support for up to <u>five</u> years on top of GTA/GRA support
- ❖ U.S. Citizen, Permanent Resident, or U.S. National
- ❖ 46 CDFs awarded FS15-FS20

Chancellor's Fellowship (CF), FS07-FS15

- ❖ Chancellor's Fellowships provide a waiver of all required in-state and out-of-state tuition and fees
- ❖ Be a U.S. Citizen, Permanent Resident, or U.S. National.
- ❖ Mostly to PhD programs. Roughly 10% at discretion of GE.
- ❖ FS07: 67. FS08: 0. FS09: 30. FS10: 96. SP11: 74. SP12: 92. FS13: 74. FS14: 90. FS15: 83.
- ❖ Average number of awards per year: 70 – 100

Focus on PhD Progs.

Very hard to start nascent graduate programs.

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S&T Graduate Education

Increasing Grad. Stud.

Graduate Certificates
- ❖ Graduate certificates provide the opportunity to broaden knowledge in a particular discipline and to stay competitive in today's marketplace.
- ❖ May count toward graduate degree.

Grad Track Pathways
- ❖ UG may use up to 9 credit hours towards a subsequent MS degree.

Dual Degree Programs
- ❖ Work with international partners
- ❖ Student spends about equal number of years at both institutions
- ❖ Student receives degrees from both universities

S&T Graduate Students' Bill of Rights

Graduate Council, April 6, 2022: Approve!
CGS, April 20, 2022: Approve.
GSBoR posted w/ support letter at URL
https://cgs.mst.edu/billofrights/

MISSOURI S&T
Office of the Provost

TO: Faculty and Staff, Missouri University of Science Technology
FROM: Colin Potts, Provost and Executive Vice Chancellor for Academic Affairs
Richard Wlezien, Vice Provost and Dean, College of Engineering and Computing
Kate Drowne, Interim Vice Provost and Dean, College of Arts, Sciences, and Business
DATE: April 20, 2022
RE: Support for the Graduate Student Bill of Rights

MISSOURI S&T

Grad. Educ.

MISSOURI S&T

Explore S&T

Home | Events | Bill of Rights | About Us ▾ | Contact Us

MISSOURI S&T COUNCIL OF GRADUATE STUDENTS

📍 G8 Norwood Hall 320 W. 12th St. Rolla, MO 65409 | 📞 (573) 341-4141 | ✉ cgs@mst.edu | 🔊 MinerLink

cgs.mst.edu ▸ Bill of Rights

⊞ Preamble

⊞ Academic Rights

⊞ Rights Regarding Information

⊞ Rights Regarding Professional Development

⊞ Freedom from Discrimination and Adverse Conduct

⊞ Postamble

Bill of Rights PDF

GSBoR

S&T Grad. Ed.

"Making the Graduate Student Bill of Rights part of the common fabric of Missouri S&T ==will require broad acceptance and support by the faculty== and implementation also ==will require significant adjustments to procedures and practices==. I can assure our graduate students that efforts have been ongoing to facilitate the implementation of the goals across the three colleges and some aspects will require engagement by Human Resources (HR), the Office of Technology Transfer and Economic Development (TTED), and others."

S&T MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY
· ROLLA, MISSOURI ·

Graduate Education
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300 W 12th Street
Rolla, Mo. 65409
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grad@mst.edu
grad.mst.edu

January 19, 2023

To: Gaurav Khaimar, President, Council of Graduate Students (CGS), Missouri S&T
Re: Support by *Graduate Education* for the Graduate Student Bill of Rights (GSBoR)

Dear Gaurav and Members of CGS:

The Graduate Student Bill of Rights (https://cgs.mst.edu/billofrights/) was presented to the Graduate Council and on April 6, 2022, Council passed a resolution of support. Shortly thereafter, on April 20, 2022, the GSBoR was endorsed as a guiding document by Dr. Colin Potts, Provost and Executive Vice Chancellor for Academic Affairs, Dr. Richard Wlezien, Vice Provost and Dean, College of Engineering and Computing, and Dr. Kate Drowne, Interim Vice Provost and Dean, College of Arts, Sciences, and Business.

My predecessor, Dr. Costas Tsatsoulis, Vice Provost of Graduate Education was enthusiastically in support of the GSBoR and the support by *Graduate Education* for the Graduate Student Bill of Rights "goes without saying". Nevertheless, it is my pleasure and an honor to write this letter today to add my name and *Graduate Education* formally, explicitly, and demonstratively to the list of supporters.

Making the Graduate Student Bill of Rights part of the common fabric of Missouri S&T will require broad acceptance and support by the faculty and implementation also will require significant adjustments to procedures and practices. I can assure our graduate students that efforts have been ongoing to facilitate the implementation of the goals across the three colleges and some aspects will require engagement by Human Resources (HR), the Office of Technology Transfer and Economic Development (TTED), and others.

It is the stated mission of *Graduate Education* (https://grad.mst.edu/about/) to implement the values of Missouri S&T (https://www.mst.edu/about/#ourvalues) and *Graduate Education* recognizes that quality advising and mentorship enhance the adventure and the success of graduate education. Everyone in *Graduate Education* takes pride in serving our exceptional, diverse, and determined student body and campus community.

We want to take this opportunity to point out that Missouri S&T has well established paths for students to address concerns that might arise in their graduate careers. Students having concerns or complaints regarding their academic experience should first discuss the matter with the faculty member(s) and/or advisor(s) involved and perhaps in consultation with the chair of the department. At the next level, students may bring their issues to the attention of the respective Dean's Office, i.e., the College of Arts, Sciences, and Education (CASE, email: case@mst.edu), the College of Engineering and Computing (CEC, email: cec@mst.edu), or the Kummer College of Innovation, Entrepreneurship, and Economic Development (KI, email: kummercollege@mst.edu). At the campus level, graduate students may contact *Graduate Education* (email: gradsupport@mst.edu, grad@mst.edu) and/or the Department of Student Support and Community Standards (email: studentsupport@mst.edu, https://studentsupport.mst.edu/communitystandards/studentcomplaintprocess/) for guidance on filing complaints and grievances.

For *Graduate Education*,

Dr. Rainer Glaser, Interim Vice Provost of Graduate Education

GE Support

GSBoR

GSBoR

STRESS AND UNCERTAINTY DRAG DOWN STUDENT SATISFACTION

PhD and master's students struggle with work–life balance and support for training and mental health, finds *Nature*'s 2022 survey. **By Chris Woolston**

Nature | Vol 610 | 27 October 2022 | **805**

Fear of retribution.

MISSOURI **S&T**™

Work / Careers

MISTREATED STUDENTS

Bullying, harassment and discrimination remain persistent problems in graduate education, but not all targets feel capable of speaking out. Supervisors are the most common perpetrators of bullying. Discrimination, where it exists, is most likely to be on the basis of gender or race.
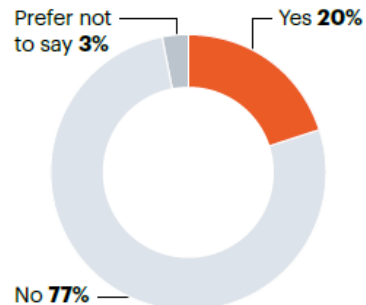
Do you feel that you have experienced bullying during your graduate degree?

Prefer not to say **3%**
Yes **18%**
No **79%**
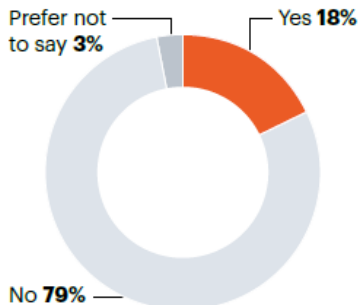
Do you feel able to speak out about your experiences of bullying without personal repercussions?*

Unsure **18%**
Yes **26%**
No **57%**
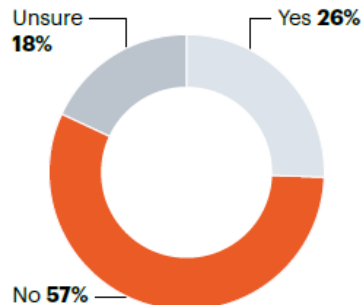
Do you feel that you have experienced discrimination or harassment during your graduate degree?

Prefer not to say **3%**
Yes **20%**
No **77%**

Who was the perpetrator?†

Supervisor	46%
Another student	40
Other academic staff member	34
Postdoc	3
Online troll	2
Other	5
Prefer not to say	2
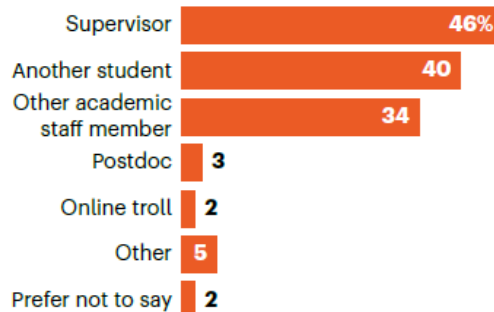
Which of the following have you experienced?†

Gender discrimination	45%
Racial discrimination or harassment	30
Sexual harassment	17
Age discrimination	16
Disability discrimination	10
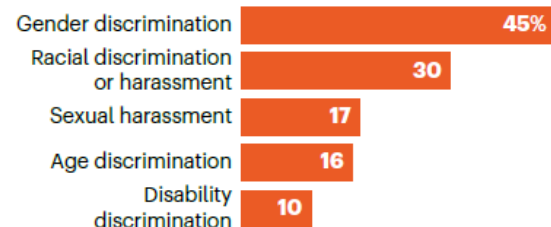
*Some percentages do not add up to 100% because of rounding.
†Respondents could select more than one option.

S&T GE: Areas to Revisit

Graduate Student Employment (most frequent source of conflict)

➢ Workload and Vacation: HR, Cindi Nelson

➢ Compensation & Stipend-X: GE & Provost Office, HR

➢ Change of Adviser: Department (& College)

Intellectual Property / Copyright

➢ I&E: Dr. Timothy Faley, AVC, Tech. Transfer Econ. Development

➢ Thesis Withholds: Dr. Roger Weaver, Dean of the Library

Desiderata

We hear Council of Graduate Students (CGS) and our graduate students, and we are committed to more effectively implement the CRR and foster a student-centered culture.

The presentation will be welcome of a "Graduate Students' Bill of Rights 2.0" that more fully recognizes CRR, HR, and IP regulations.

There are lots of opportunities for CGS to advance the careers of graduate students through proactivity: Peer guidance, peer mentoring,…. GE will be a willing partner, Well-Being will be an equally engaged partner,…

With rights come responsibilities.

GE = Graduate Student Success

Graduate Student Success

There is a need for consistent **tracking** of graduate student progress and of graduate student **mentoring** in the departments across all colleges.

Tracking activities include documentation of program milestones (Graduate Educations Forms), graduate student support (GTA, GRA) in academic year and summer, GTA and/or GRA performances, and research progress (research training and research products).

Mentoring activities include regular meetings with research adviser, annual meetings with graduate committee members, guidance to graduate student engagement in discipline-based skill building activities (laboratory, courses, workshops, webinars), in the development of communication skills (papers, presentations, various media), and the socialization into networking (campus and professional settings, travel).

Graduate Education Manager

Initial Meeting, July 14, 2022: Participants representing **Graduate Education**.

Followed up with provision of recorded demo from elsewhere.

First Demo Meeting, Aug. 17, 2022: Participants representing **Graduate Education**, **Kummer Institute**, and **Institutional Research**.

Recording of this session is available.

Second Demo Meeting, Oct. 14, 2022: Participants representing Graduate Education, Kummer Institute, Institutional Research, Registrar, Provost, Deans, et al.

Timeline & Budget: Received Oct. 24, 2022.

Third Demo Meeting, TBD in SP23: Previous participants and Chairs.

cayuse

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cayuse
Researcher Success
Inventions • Repository

cayuse
Research Outcomes
Graduate Education Manager

Graduate Education Manager

Pricing Proposal: Graduate Education Manager Annual Fees
2022 New Customer Pricing Program

Subscription and Implementation:

- Subscription fees cover unlimited users, all system support and maintenance, hosting infrastructure (two environments) and new feature development throughout your subscription.

Item	Year 1	Year 2	Year 3	Notes
Software Subscription				
Graduate Education Manager Subscription Fees	$ 31,083	$32,326	$33,619	
Total Subscription	$ 31,083	$32,326	$33,619	4% capped annual price increase
Software Implementation *These fees cover the known requirements at time of quote for form development and workflow configuration for unique processes such as COI disclosure				
Graduate Education Manager Implementation, form and workflow configuration, training	$53,950	-	-	One time fees only
Total Investment	$85,033	$32,326	$33,619	

cayuse

Researcher Success
Inventions • Repository

Research Outcomes
Graduate Education Manager

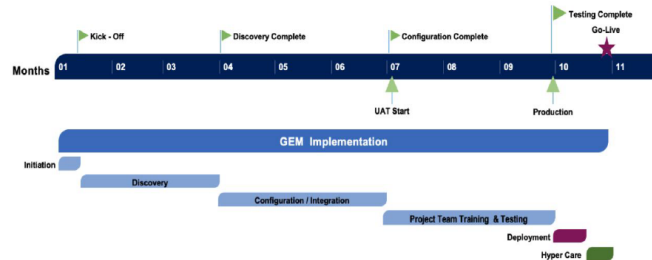MISSOURI S&T

Graduate Education Manager

Resource requirements - IT

Data/ IT Specialist (Technical Lead)
- Work together with Cayuse technical consultant to develop a detailed plan for integrations
- Responsible for providing data for migration and integration to Cayuse Graduate Education Manager
- Work with internal Cayuse team to test and troubleshoot the integrations within the application
- Ensures that Customer internal resources are adequate and available to manage the set-up and maintenance of interfaces and data feeds

Phase	IT Engagement-Activity	Deliverable
Discovery	Data Integration Workshops	Validated Data flows Clarified Data Requirements
Configuration	Integration with data feeds from university systems	Associated Data Files
	Initiate setup of hostname and SSL certificate	Prep completed for building Production
Testing/Training	Integration Testing	Integration Testing Complete Issue Resolution Log
	Load Migrated Historical Data	Historical Data Loaded to Tenant for Testing and Review
	Review Migrated Historical Data	Complete Review and Testing of Historical Data

cayuse Researcher Success
Inventions • Repository

cayuse Research Outcomes
Graduate Education Manager

Graduate Education Manager

<u>Senior Student Service Coordinator</u>
GGS 10: $ 74.652
Minimum Salary: $52,223
Benefits: $10,000
FICA: $12,429

Works with Cayuse, IT, and department leadership to implement 1-3 departments at a time. Trains department academic affairs staff in the application of the software/database. Works with faculty and graduate students to ensure proper use of the functionalities.

cayuse

IT

Registrar

New SSSC in GE

KC Depts

CEC Depts

CASE Depts

cayuse

cayuse Researcher Success
Inventions • Repository

cayuse Research Outcomes
Graduate Education Manager

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Graduate Student Travel Fund

Graduate Education

Funding ▼ Graduate Programs ▼ Prospective Grad…

- Funding Opportunities
- Finding a Faculty Advisor
- Research and Labs
- Current Fellows
- Travel Fund
- Stipend X

https://grad.mst.edu/currentstudents/travelfund/

Up to $500 per student every two years to present at conferences

Funded by Office of the Vice Chancellor for Research and Innovation

Up to 20K per year

Please encourage your students!

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GE = Graduate Student Success

Recruiting Visit Reimbursement

https://grad.mst.edu/faculty/recruitmentfunding/

When your academic department invites prospective graduate students to campus, Graduate Education will help you reimburse up to $500 of the student's travel costs.

Up to $500 per student visit; Up to 20K per year for each of AY22/23 and AY23/24

Funded by the Office of the Vice Chancellor for Research and Innovation and by the Provost

Please encourage your <u>faculty</u>!

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GE = Graduate Student Success

Recruiting Visit Reimbursement
Addresses Domestic Student Recruiting URM

https://ncses.nsf.gov/pubs/nsf23300/report/path-to-the-doctorate

- The number of doctorate recipients from U.S. universities dropped for the second consecutive year. The decline from 55,224 doctorate recipients in 2020 to 52,250 in 2021 was the steepest 1-year decline (-2,974) in the history of the SED.
- Between 2020 and 2021, the number of U.S. citizen and permanent resident doctorate recipients decreased by 8% to 31,674, while temporary visa holders decreased by 5% to 17,638.

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GE = Graduate Student Success

Let's Talk Graduate Education

Graduate Education traditionally offers the "Let's Talk" series on Wednesdays afternoon, 3-4 pm. These events address a variety of topics to help graduate students succeed at navigating S&T. The series has been suspended for SP23 because of personnel turnover in Graduate Education. We will be back soon!

GS Success

- September 7 - *Information & Resources,* presented by Graduate Education - Computer Science Room 222 or Zoom
- September 14 - *Master's Degrees - Plan of Study, Enrollment, & Campus-level Requirements,* presented by Graduate Education Specialists, Jade Sinnott & Kathy Shepherd - Toomey Hall Room 140 or Zoom
- September 21 - *Make Your Own Stress Ball!* - Computer Science Room 222 or Zoom
- September 28 - *Campus & Community Resources,* presented by Student Support Specialist, Erica Reven - Toomey Hall Room 140 or Zoom
- October 5 - *Student Organizations for Graduate Students,* presented by representatives from various S&T student groups - Toomey Hall Room 140 or Zoom
- October 12 - *Doctoral Degrees - Plan of Study, Enrollment, & Campus-level Requirements,* presented by Graduate Education Specialists, Jade Sinnott & Kathy Shepherd - Computer Science Room 222 or Zoom
- October 19 - *Embracing Imposter Syndrome,* presented by Student Support Specialist, Erica Reven - Toomey Hall Room 140 or Zoom
- October 26 - *Time and Stress Management, presented by Simran Bhatia from Student Well-Being* - Toomey Hall Room 140 or Zoom
- November 2 - *Technical Editing Resources* - Toomey Hall Room 140 or Zoom
- November 9 - *Graduation Prep,* presented by Commencement Committee - Toomey Hall Room 140 or Zoom

MISSOURI S&T™

Wood named technical editor for graduate education

Posted by Kimber Crull
On December 1, 2022

Leah Wood is the new technical editor for graduate education. Editing services offered by graduate education are free to S&T students and include editing of journal articles, conference papers, theses and dissertations. Documents are reviewed for English usage, grammar and mechanics, documentation, sentence structure, word choice, clarity, and organization. Wood will also offer writing workshops and presentations to students beginning in the spring semester.

Prior to joining S&T, Wood was a graduate research and teaching assistant at Indiana University-Purdue University Indianapolis. She holds a bachelor's degree in elementary education and a master's degree in geology, both from Ball State University. Wood published an original research article in *Frontiers in Earth Science* in 2020 and has contributed to several others as a coauthor. She has served as a peer reviewer for *GeoHealth*, a journal of the American Geophysical Union, and she has been an invited speaker at *Earth Science* seminars, science teaching workshops and town hall-style events. Wood lives in Rolla with her husband and two cats. She enjoys hiking, reading and studying history.

Learn more about graduate education's technical editing services at **grad.mst.edu/currentstudents/editing/**.

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GE = Graduate Student Success

Graduate Research Showcase

Event to highlight Graduate Student Research and promote networking with prospective employers.

GS Success

Poster and Oral Presentations during the day.

Judged by invited leaders from potential employers.

Awards banquet with featured lecture by invited speaker.

GRAD poster and oral session – Tuesday, April 12, 2023.

UG poster and oral session – Wednesday, April 13, 2023.

BoC meeting at S&T – Thursday, April 20,2023.

MISSOURI S&T

GE = Graduate Student Success