

CNAS 2019 Annual Report

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The CNAS Strategic Plan and Goals document is updated each year (June-September) but is driven by our vision, mission and shared values.

Mission - The College of Natural and Applied Sciences develops global citizen scholars who are prepared to increase understanding of the natural world and applied sciences within society and to be productive and successful in their careers.

Vision - The College of Natural and Applied Sciences at Missouri State University seeks excellence in teaching, scholarly productivity, and professional and community service.

Shared Values - We value

- ❖ our students and their success;
- ❖ active learning, academic rigor and critical thinking;
- ❖ excellence in teaching, research and service;
- ❖ inclusiveness, fairness and justice;
- ❖ faculty, staff and administrators;
- ❖ personal and academic integrity;
- ❖ safe learning environments;
- ❖ collaborations and partnerships; and
- ❖ continuous improvement.

The annual report is structured around a set of college goals which are tied to the university long range plan and annual goals. All college annual reports are posted on the college website - <http://science.missouristate.edu/College-Annual-Reports.htm>. All department annual reports which include assessment reports are posted on a password protected website – Go to <http://science.missouristate.edu/restricted/assessment.htm> and click on assessment and reports.

Program Review/Accreditation/Action Plans Update –

Biology – Action Plan accepted March of 2016. The new BSFS is complete and we are moving forward to plan for full utilization. Good year for online course development. External funding for GA's is increasing (5 funded for AY and eight funded for summer). BIO RPT Policy revised this year. Next self-study due June 1, 2022

Chemistry – Action plan accepted June of 2018. CHM160 is part of general education program. Graduate students are doing office hours at Bear Claw to partner on tutoring. CNAS Student Success advisors are helping with advising loads in the department. CHM RPT Policy revised this year. Next self-study due 2024

Computer Science – Accredited through September 30, 2021. Accreditation required update in summer of 2020 related to assessment. Report is submitted and outcome expected in later summer of 2020 (virtual review only). Department continues to see growth in both BS and MS programs. CSC RPT Policy review will take place by Feb 2022. Current challenges – faculty salaries and teaching loads.

Geography, Geology & Planning – Action Plan accepted Spring of 2017. A space master plan was developed that reallocated space within the department to increase the amount of research space. Most research active faculty now have their own research space. A number of certificate programs have been added over the last two years and the two GIS certificate programs (undergraduate and graduate are now

fully available online). GGP RPT Policy revised this year. Next self-study due June 1, 2023

Hospitality Leadership – Accreditation through summer of 2025. Primary action has been to hire outstanding faculty. The entire BS and BAS programs are online. A marketing plan will be implemented with the helping of university personnel. HL RPT Policy will be reviewed and submitted by Feb 2021.

Cooperative Engineering Program – ABET Accredited through Missouri S&T and the next ABET review will be in the fall of 2020. Mechanical engineering freshman were admitted starting fall 2019. Construction of phase II of renovations will be complete in late summer of 2020.

Mathematics – Action Plan accepted in spring of 2018. The new college algebra course and pre-calculus sequence continue to be developed. MTH RPT Policy revised this year. Next self-study due 2024.

ABC Rates in Mathematics					
Course	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019
MTH101	53.45% (507)	42.62% (245)	58.33% (492)	40% (176)	54% (396)
MTH103	55.00% (280)	52.78% (108)	62.26% (265)	49% (63)	61% (180)
MTH130	72.05% (254)	63.40% (194)	72.69% (265)	73% (215)	68% (234)
MTH135, now 134	57.80% (899)	47.15% (563)	74.09% (656)		
MTH136	*	*	42.51% (167)	49% (88)	57% (155)
MTH137				63% (65)	45% (100)
MTH138	70.31% (128)	70.97% (62)	74.26% (136)	52% (85)	74% (137)
MTH261	70.63% (126)	59.09% (88)	63.75% (160)	60% (86)	60% (119)
MTH287	74.73% (186)	73.17% (123)	69.35% (186)	71% (158)	66% (131)

A few observations are in order.

- Fall pass rates are higher than spring for most courses. Sometimes spring is a second attempt or sometimes it just lengthens the time between when they had their last math class in HS and when they attempt math at MSU.

Physics, Astronomy & Materials Science – Action plan accepted in summer of 2017. The department has made progress in their collaboration with OTC. A major renovation in Kemper Hall is complete and has allowed for research collaboration between PAMS and CHM. The PAMS RPT Policy was revised this year. Next self-study is due 2024.

Academic Profile

- ❖ CNAS – HL, CHM and engineering increased # of majors from 2018-2019. The percentage of students graduating fluctuates greatly from year to year so a range of values for the past three years is included.
 - ❖ Table of CNAS majors – Appendix 1, page 11
 - ❖ Table of CNAS graduates – Appendix 2, page 11
 - ❖ Percentage of students graduating – Appendix 3, page 12
- ❖ CNAS added new certificates that support workforce development. All certificate programs requiring no prerequisites are labeled. Most are still too new to have significant enrollment. All advisors will work on getting students enrolled in 2020.
 - ❖ Table of certificate programs – enrollments and completions – Appendix 4, pages 13-14
- ❖ Computer Science – Ten MS graduates completed in year two of the graduate program.

- ❖ Science teacher education students have all transitioned from the BSED to the MAT program. There are currently 15 students taking courses in the MAT program or who have recently completed licensure to teach in the state of Missouri. There are undergraduate students in the pipeline preparing for the MAT in science and we are able to track/advise/prepare these students. Enrollment in BSED in MTH has been dropping over the past couple of years. We will be investigating the drop this year and recruiting for more teachers.
- ❖ CNAS continues to expand online offerings. BS and BAS in Hospitality Leadership are fully online. A plan to for STEM online education will be developed in 2020.
- ❖ Mechanical Engineering is admitting students for fall of 2019. Phase II of renovation will be complete by early fall of 2020. Faculty hiring will begin in 2021.
- ❖ Barrier Removal – Provost funded three DFW projects in CNAS – MTH, CSC and CHM in 2020. These projects are just getting started and full implementation will occur in fall of 2020.
- ❖ CNAS continues to work closely with OTC. All OTC biology students visit Temple Hall each semester. MSU biology and chemistry TA’s continue to work at OTC.
- ❖ The PSM track of the MNAS has continued to see growth and placement in internships has increased.

Student Experience

- ❖ All student accomplishments are documented in our CNAS News Blog. A listing can be found in appendix 10, pages 19-22.
- ❖ Two groups of CNAS faculty were trained in proactive advising in 2018 and 2019. Because this is valuable information another cohort will be trained in 2020. Proactive advising is primarily done by staff advisors in CNAS – not the individual faculty trained.
- ❖ The 2020 CNAS undergraduate research day was postponed to fall 2020 and will be virtual.
 - ❖ Publications and publications/presentation with student co-authors - Appendix 5, pages 15-16
- ❖ MTH is using “free textbooks” in several courses. These are from OpenStax, based at Rice University.
- ❖ Online student evaluation of faculty through Blackboard will continue in CNAS.
- ❖ A student expo is held each fall semester to recruit new members into the various CNAS student organizations and the leaders of student organizations within CNAS meet with Dean’s staff on a regular basis.
- ❖ In 2015 we distributed nearly \$150,000 in foundation scholarships. It became clear that the common application for foundation scholarships is not user friendly and that students are not applying for this money so CNAS offered sessions to help students apply. Students still struggle with the application for foundation scholarships but this year we distributed over \$160,000 in foundation scholarships. CNAS will recognize all recipients on a [website](#), in a press release and in newsletter.
 - ❖ Scholarship dollars distributed – Appendix 6, page 16-17

Diversity and Inclusion

- ❖ CNAS has an active diversity committee.
- ❖ Three faculty participated in FCTL Diversity Scholars program this past year.
- ❖ Statements regarding diversity and inclusion from professional organizations. #BlackLivesMatter. These are posted on the CNAS Diversity Website.

- ❖ One CNAS goal has been - seek grant funding. Four years ago the CNAS Diversity Committee compiled the following list - <https://science.missouristate.edu/Scholarships.htm> which is posted on our website and it is time to update the list but also time to share projects that are in progress.
 - Dr. Tayo Obafemi-Ajayi is leading the NSF funded Mo LSAMP program at MSU - <https://science.missouristate.edu/lamp/>
 - Dr. Matt Pierson is currently leading the NSF STEM Scholars program at MSU - <https://sstem.missouristate.edu/>
 - Dr. Einhellig, Dr. Rebaza and I received NSF funding for an Advance program at MSU - <https://science.missouristate.edu/ADVANCE.aspx> We are still in the first year of this project but will be sharing updates soon.
 - CNAS submitted a preproposal to the HHMI Inclusive Excellence program early this year. The pandemic is slowing down the review process but we hope to hear something this fall.
 - Leaders of the MSU TRIO Program are interested in partnering with us to submit a Math/Science Upward Bound grant in 2021 and a McNair grant in 2022.
- ❖ A goal has been to bring in more diverse seminar speakers and the departments have done a great job with this. We need to continue to do this.
- ❖ We are supportive of inclusive learning practices. Several CNAS faculty attended the Humanity of Inclusive Practices course in July. Faculty are sharing with their departments and with college.
- ❖ Two faculty in CNAS are involved with GREAT - **Globally Responsive Education and Teaching** - Associate Deans Xiaomin Qiu and Kyoungtae Kim have been very active with **GREAT**, an initiative launched by International Leadership and Training Center, Office of China Programs, and Faculty Center for Teaching and Learning to promote dialogues and discussions on the internationalization of curriculum and instruction.
 - link for the videos about teaching international students online - <https://international.missouristate.edu/great.htm>
 - Interested in a framework of developing an active online courses for international students - <https://p-zhang.com/framework-for-the-development-of-active-and-reflective-online-course-for-international-students/>

Globalization

- ❖ CNAS faculty lead study-away programs for students.
- ❖ We continue 3+1 programs with Chinese universities and work with the MSU China Programs office.
- ❖ Several CNAS faculty went China last summer to teach for approximately two weeks. All expenses are paid by the Chinese university. Several more were signed up for 2020 but travel became impossible. Faculty continue to be interested in the program.

Infrastructure

- ❖ BSFS educational facility construction is complete except for internet access.
- ❖ Phase II of mechanical engineering renovations will be complete in 2020.
- ❖ CNAS Master Planning study is complete and we just need external funding to begin.

- ❖ The college implemented a college fee starting in fall of 2019. Funds are used to support student success staff and infrastructure improvements.

Research

- ❖ The college distributed over \$10,000 in incentives to faculty for submitting grants requesting in excess of \$30,000. These dollars are transferred to departments for faculty to use for travel or research expenses.
- ❖ Sponsored Research Activity as of June (annual report not yet available) – See [BOG June Agenda page 153](#)
 - 8/41 total staff submitting grants are from CNAS
 - 46/102 faculty submitting grants are from CNAS (45%)
 - 9/43 total staff awarded grants are from CNAS
 - 24/63 faculty awarded grants are from CNAS (38%)
 - 124/356 submissions were from CNAS (35%)
 - 80/278 awards are from CNAS (29%)
 - Overall CNAS has only 16% (125/759) of the faculty at MSU
- ❖ The college currently has allocated over \$1.8 million (one-time dollars) for start-up funds for tenure track faculty over the past six years. In addition, summer fellowships for newly hired tenure-track faculty are funded with one-time funds in the college. The start-up funds are typically spent within the first three years of a faculty member's time on campus. By year four many have external funding.

Funding

- ❖ CRPM and OEWR are totally self-funded. Both centers have funding to meet current staffing needs and the demands of southwest Missouri.
- ❖ It is clear from the data (grants submitted/received and publications) that CNAS has the strongest culture of research/scholarly activity at Missouri State University.

Partners for Progress

- ❖ Continue to work with community colleges
- ❖ Continue collaborations with K-12 schools and science/math competitions
- ❖ Continue collaborations with National Park Service, USGS and others
- ❖ MSU remains the host institution in Missouri for Project's WET, WILD and Learning Tree – although this is a current challenge for us
- ❖ Continue hosting regional science fair and science Olympiad and Pummill Relays.
- ❖ Continue to support GLADE, a summer camp for science students
- ❖ Continue to partner with Springfield-Greene County Library on projects
- ❖ Continue to partner with Discovery Center, Dickerson Park Zoo, Department of Conservation and others.
- ❖ HL faculty engaged with Missouri ProStart Schools
- ❖ CRPM and OEWR continue to work with city, county and area communities.

Valuing and Supporting People

2020 Promotions

- Promoted to Distinguished Professor
 - Xingping Sun - MTH
- Promoted to Associate Professor with tenure
 - Gautam Bhattacharyya – CHM
 - Razib Iqbal - CSC
 - Sean Maher – BIO
 - Steven Senger – MTH
 - Patrick Sullivan - MTH
 - Ryan Udan – BIO
- Promoted to Senior Instructor
 - Helena Metzker – CHM
 - Robert (Sam) Brown - MTH

CNAS currently has twelve distinguished professors (eleven active and one retired).

University Award Winners - 2020

Kyoungtae Kim

- MSU Foundation Award for Teaching
- Outstanding Graduate Mentor 2020

Paul Durham

- MSU Foundation Award for Research
- 2019-2020 Public Affairs Fellow

Ridwan Sakidja

- Outstanding Thesis Advisor 2020

Rich Biagioni

- General Education Assessment Award

Liza Cobos

- FCTL Diversity Scholar

Matt Siebert

- FCTL Diversity Scholar

Avery Russell

- FCTL Diversity Scholar

Rohit Dua

- FCTL High Impact Learning Practices Award

Kimberly Van Ornum

- Certified Distance Educator

Gary Meints

- Curtis P. Lawrence Excellence in Advising
- NACADA 2020 Outstanding Advising Award

- ✓ CNAS established a new awards process in 2011 for faculty and staff to recognize outstanding work. First awards given in May of 2012 and listed below are the 2020 award winners based on their 2019 performance.

- **Atwood Research and Teaching Award**
 - Kevin Mickus – Geography, Geology and Planning
- **CNAS Excellence in Teaching Award Winners**
 - Laszlo Kovacs – Biology
 - Chris Lupfer - Biology
 - Gary Meints – Chemistry
 - Judy Meyer – Geography, Geology and Planning
 - David Perkins – Geography, Geology and Planning
 - Fan Zhou – Mathematics
- **CNAS Excellence in Service Award Winners**
 - Michelle Bowe– Biology
 - Melanie Carden-Jessen – Geography, Geology and Planning
 - Dave Cornelison – Physics, Astronomy and Materials Science
 - Matt Pierson – Civil Engineering/Geography, Geology and Planning
 - Lloyd Smith – Computer Science
- **CNAS Excellence in Research Award Winners**
 - Paul Durham – Biology
 - Kyoungtae Kim – Biology
 - Quinton Phelps - Biology
 - Tayo Obafemi-Ajayi – Electrical Engineering/Computer Science
 - Ridwan Sakidja – Physics, Astronomy and Materials Science
 - Matt Siebert - Chemistry
- **Faculty/Staff Excellence Awards—Student Nominated, Student Selected**
 - Melanie Carden-Jessen – Geography, Geology and Planning
 - Shelby Kilmer - Mathematics
 - Day Ligon - Biology
 - Ryan Udan - Biology
- **CNAS Excellence Awards – Staff**
 - Linda Allen - Chemistry
 - Marc Owen – Ozarks Environmental and Water Resources Institute (OEWRI)

NEW CNAS Faculty – tenure-track

2020 Mohammed Belkhouche, CSC – PhD University of North Texas

2020 Yue Cui, MTH – PhD University of Kentucky

2020 Renata Fernandes Guzzo, HL – PhD University of Houston

NEW CNAS Faculty – instructor

2020 Bradley Mills, PAMS – PhD University of Missouri - Columbia

All departmental accomplishments are noted in departmental reports available on CNAS website.

Executive SWOT Summary

2019-2020 will be a year that we will not forget. Although we had a productive start to the year – the global pandemic will affect us for years to come.

Goals that we continue to work on -

Retention and completions are still a challenge for many CNAS departments for a variety of reasons. All units have reviewed data and have an action plan to address the challenge of completing 25% students with BS or MS degrees each year (or maintaining enrollment if their percentage is higher – a recruitment challenge.) In addition we have three departments working on courses with high DFW rates. These projects will be implemented for the first time in fall of 2020 so data will not be available for at least a year. We will seek out more projects. Recruitment - at the college level new videos have been developed and are being used, student success personnel are doing awesome work, and many have stepped up to make phone calls to students.

CNAS Master Plan – The CNAS Master Plan is complete and now it is time to find the external funds to make it happen. That is my personal goal for the next two years!

Strengths – Faculty/student research; excellence in teaching by many, many faculty; external funding (funding is up); instrumentation and facilities; and outstanding students. Teaching facilities continue to improve.

Weaknesses – Many teaching facilities in science and math remain dated; need for more research space in the sciences – especially if we are to increase the number of STEM graduates. With dated science labs and facilities – recruitment is more difficult! The Master Plan has been designed to identify renovation needs as well as new space needs for CNAS.

Opportunities – External funding opportunities in the sciences; PSM program; strategic uses of online education in all units. Graduate programs in the college could grow significantly with additional assistantships, faculty and space. Appropriate marketing for online HL programs needs to happen immediately in order to capitalize on these newly developed programs and although we started on this we had to pause for a few months. The CNAS College Fee is opening the door to renovate and add space to the college although as noted above it cannot do it all..

Threats – Declining enrollments threaten to decrease the number of tenure-track/tenured faculty in the college. Lack of space for growth. Lack of recurring funding for service contracts on major instrumentation. Decrease in federal grant funding. Lack of outstanding STEM facilities impedes recruitment of students.

Action Plan for 2020-2021 will be available in September

CNAS Summary of Assessment Update –

Departmental annual reports from 2019 included assessment data and analysis. These reports are available upon request.

BIO – The department reviewed the following goal – apply methods of scientific inquiry in biology. A pre-test and post-test was designed for undergraduate research students to see if there were differences between traditional undergraduate research and course-based research. There were interesting results and the department is now reviewing student impact – how many students do each activity and how they can make the biggest impact.

CHM – The department continues to review four SLO's through undergraduate research courses CHM399/499. SLO3 indicates that students will demonstrate proficiency in the use of appropriate instrumentation to collect and record data from chemical experiments. The department uses course grades for four lab courses to determine success. The department's target is to have 100% students earn a C grade or higher in these four courses. Overall it appears they are over 90% but have not met their target. Due to all of the curricular changes in recent years the assessment plan was updated. It is posted on the CNAS Assessment website.

CSC – The department has collected data on all SLO's and courses as required for their ABET accreditation. The results of the accreditation visit in 2019 resulted in a further report in 2020 with regard to accreditation. The report analyzed all SLO's and the following course revisions were made:

1. CSC 244 Computer Architecture – **New course**
2. CSC 360 Operating Systems – **New course**
3. CSC 388 Introduction to Secure Computing – **Changed to 3 credit hour course**
4. CSC 565 Computer Networks – **Changed from elective to core course**
5. CSC 450 Introduction to Software Engineering – **Successful completion of the computer science major field test (MFT) with at least a score of 50th percentile**
6. CSC 450 Introduction to Software Engineering – **Changed pre-requisite from CSC 344 to CSC 325, CSC 335, and CSC 360. This ensures that students don't take this course too early as it gives them capstone experience as well as they will not take MFT prior to completing all the critical course material.**

GGP – GGP began a new assessment program this year. One discussion item was DFW rates for courses. GLG115 was used as an example with a great deal of data shared followed by a faculty discussion. The faculty member is adding study guides for each exam to improve student success. The planning program focused on a discussion of their 500 level practicum course which demonstrates mastery. That discussion led to questions about how the students start the program and are prepared. This year they will focus on PLN100 and GEO200.

Geology, geospatial science and geography had similar conversations.

HL – A complete analysis of all learning outcomes was submitted. The assessment of the following SLO - Students will acquire and demonstrate a comprehensive understanding of hospitality industry knowledge – showed good results. Even though benchmarks were reached, feedback from the advisory board led to the development of a redesign of HSP 210 is occurring in 2020 and a new course, HSP 230, will be introduced that highlights concepts and theories related to guest services specifically for the hospitality industry. Another SLO that led to curricular changes - Students will acquire an understanding of the importance of tourism and the hospitality industry's role in supporting this vital economic force. Industry partner feedback and curriculum evaluation led to the revision of HSP 210 assignments. The assignment related to the industry's economic impact was changed to provide the student with experience reading and evaluating reports and demonstrate their understanding of the impact of the industry to local economies. Additionally, the economic impact of the tourism industry was further reinforced and emphasized in HSP 410 and HSP 480 course content and assignments. Combined, these efforts helped improve previous exit examination scores. All assessments showed that students in the HL program have an outstanding preparation.

MTH – The math faculty focused on three assessments – MFAT exam results, exit survey responses and graduate comprehensive exams. The MFAT exam results show consistency over the past five years. **The exit survey responses were detailed and provide a great list for the department to work on in the coming year. A specific action plan needs to be written in 2020 with measurable goals.** Data from graduate comprehensive exams indicates that students are engaged in learning at the MS level.

PAMS – The department reported on the SLO – Students will analyze the role of culture in the application of science to societal problems. PHY385 and 386 are used in this analysis. Although a pre/post ethics survey was given the results did not indicate a difference. Based on the instructor's input the class discussion was useful and valuable. The department attempted to use MFAT to show student learning outcomes but only three students took the exam so the analysis was difficult. The department attempted to analyze the following SLO – Students will utilize a wide range of printed, electronic, and information technologies to support their research on physical systems and present those results in the context of current understanding of physical phenomena. The department discovered that the rubric being used did not provide appropriate results so a new rubric is being written for the coming year. The department is also working on a rubric to analyze graduate student SLO's.

Appendix 1 – CNAS Majors

MAJORS - Academic Period (fall first census)		Fall 2016	Fall 2017	Fall 2018	Fall 2019
Department	Student Level	Headcount	Headcount	Headcount	Headcount
		Value	Value	Value	Value
Biology		742	784	798	737
	GR	42	47	44	49
	UG	700	737	754	688
Chemistry		225	207	198	226
	GR	23	19	21	25
	UG	202	188	177	201
Computer Science		354	383	446	432
	GR	3	10	23	28
	UG	351	373	423	404
Geography, Geology, & Planning		206	187	190	181
	GR	34	34	33	40
	UG	172	153	157	141
Hospitality Leadership		239	234	210	277
	GR	3	5	8	8
	UG	239	232	210	269
Mathematics		170	178	177	148
	GR	25	31	28	24
	UG	145	147	149	124
Natural & App Sci/Engineering	UG	173	173	202	260
Physics, Astronomy, & Materials Science		86	72	83	79
	GR	21	15	15	24
	UG	65	57	68	55

Appendix 2 – CNAS Graduates for the past five years

Fiscal Year (summer, fall, spring)		FY2016	FY2017	FY2018	FY2019	FY2020
Department	Headcount	Headcount	Headcount	Headcount	Headcount	Headcount
	Value	Value	Value	Value	Value	Value
Biology	Total	150	146	135	181	153
	GR	24	18	19	17	22
	UG	111	128	116	164	131
Chemistry	Total	34	33	37	32	30
	GR	13	8	8	8	5
	UG	21	25	29	24	25
Computer Science	Total	43	60	55	81	70
	GR	2	2	2	5	10
	UG	41	58	53	76	60
Cooperative Engineering	Total	38	33	31	36	32
	UG	38	33	31	36	32
Geography, Geology, & Planning	Total	80	78	57	59	56
	GR	15	26	10	12	15
	UG	65	52	47	47	41

Hospitality Leadership	Total	73	62	67	69	53
	GR	0	1	0	0	0
	UG	73	61	67	69	53
Mathematics	Total	58	42	41	29	34
	GR	22	12	11	6	9
	UG	36	30	30	23	25
Physics, Astronomy, & Materials Science	Total	31	27	19	15	13
	GR	17	11	11	5	7
	UG	14	16	8	10	6

Appendix 3

Percentage of students completing BS or MS degrees (no certificates) compared with total majors in 2017-2019 ranges

Department	Overall % grads	BS % grads	MS % grads
CNAS GOALS	25%	25%	50%
Biology	18.6-22.7%	17.4-21.6%	38.3-44.9%
Chemistry	13.3-16.2%	12.4-13.6%	20.0-42.1%
Computer Science	15.7-18.2%	14.9-18.0%	35.7%
Cooperative Engineering	12.3-17.8%	12.3-17.8%	
GGP	30.9-41.7%	29.1-34.0%	36.4-76.5%
Hospitality Leadership	19.7-32.9%	19.7-32.9%	
Mathematics	16.4-23.6%	15.4-20.4%	21.4-38.7%
PAMS	16.5-37.5%	10.9-28.1%	29.2-73%

Percentages in 2019

Department	Overall % grads	BS % grads	MS % grads
CNAS GOALS	25%	25%	50%
Biology	20.8%	19.0%	44.9%
Chemistry	13.3%	12.4%	20.0%
Computer Science	16.2%	14.9%	35.7%
Cooperative Engineering	12.3%	12.3%	-
GGP	30.9%	29.1%	37.5%
Hospitality Leadership	19.7%	19.7%	-
Mathematics	23.0%	20.2%	37.5%
PAMS	16.5%	10.9%	29.2%

Appendix 4 – Certificate enrollments and graduation numbers

Enrollments –

UNDERGRADUATE CERTIFICATES				Spring 2018	Spring 2019	Spring 2020
Certificate	Dept.	Credit Hours	Pre-reqs required?***	Enrollment	Enrollment	Enrollment
Web Programming	CSC	16		--	30	48
Applied Geophysics	GGP	12	Yes	--	--	--
Applied Geospatial Science	GGP	16 to 17	No	--	--	5
Engineering Geology	GGP	13	Yes	--	--	1
Environmental Geoscience	GGP	13 to 14	Yes	--	--	4
Geographic Information Sciences	GGP	16	No	5	5	19
Geologic Foundations	GGP	13 to 14	Yes	--	--	1
Globalization and Sustainability	GGP	12	No	--	--	--
Paleontology	GGP	12 to 14	No	--	--	4
Petroleum Geology	GGP	12	Yes	--	--	--
Small Town Planning and Development (previously Planning and Development - #s have been combined)	GGP	13	No	16	7	13
Food and Beverage Operations	HL	15	No	64	72	56
Essentials of Hospitality Management	HL	12	No	--	--	--
Lodging Management	HL	14	No	--	--	--
Advanced Hospitality Leadership	HL	12	No	--	--	--
Computational Science	PAMS	18	Yes	--	--	--
GRADUATE CERTIFICATES						
Data Science	CSC	12		--	--	4
Environmental Monitoring and Sampling	GGP	12	Yes	1	6	4
Geospatial Information Sciences	GGP	12	No	9	5	11
Petroleum Geology	GGP	12	Yes	--	--	--
Planning and Development	GGP	13	No	--	1	--
Sustainability	GGP	12	No	--	--	--
Hospitality Administration	HL	12	No	3	6	8
INTERDISCIPLINARY PROGRAMS - UNDERGRADUATE						
Conservation Law Enforcement	BIO/CRM	18 to 19	No	--	--	--
Environmental Education	BIO/GGP	14 to 16	No	5	7	4
Foundations of Pharmaceutical Science	CHM/BIO/BMS	16 to 18		--	10	37
INTERDISCIPLINARY PROGRAMS - GRADUATE						
Science Content	BIO/CHM/GGP/PAMS	18		--	--	--

Data only reflects students whose main college is CNAS and does not reflect those students from other colleges.

Certificate Completions

UNDERGRADUATE CERTIFICATES				FY18	FY19	FY20
Certificate	Dept.	Credit Hours	Pre-reqs required?***	Completed	Completed	Completed
Web Programming	CSC	16		--	31	29
Applied Geophysics	GGP	12	Yes	--	--	--
Applied Geospatial Science	GGP	16 to 17	No	--	--	1
Engineering Geology	GGP	13	Yes	--	--	--
Environmental Geoscience	GGP	13 to 14	Yes	--	--	--
Geographic Information Sciences	GGP	16	No	6	1	3
Geologic Foundations	GGP	13 to 14	Yes	--	--	--
Globalization and Sustainability	GGP	12	No	--	--	2
Paleontology	GGP	12 to 14	No	--	--	1
Petroleum Geology	GGP	12	Yes	--	--	--
Small Town Planning and Development (previously Planning and Development - #s have been combined)	GGP	13	No	4	11	13
Food and Beverage Operations	HL	15	No	37	26	30
Essentials of Hospitality Management	HL	12	No	--	--	--
Lodging Management	HL	14	No	--	--	--
Advanced Hospitality Leadership	HL	12	No	--	--	--
Computational Science	PAMS	18	Yes	--	--	--
GRADUATE CERTIFICATES						
Data Science	CSC	12		--	1	--
Environmental Monitoring and Sampling	GGP	12	Yes	2	3	7
Geospatial Information Sciences	GGP	12	No	9	6	3
Petroleum Geology	GGP	12	Yes	--	--	--
Planning and Development	GGP	13	No	--	--	--
Sustainability	GGP	12	No	--	--	--
Hospitality Administration	HL	12	No	--	3	1
INTERDISCIPLINARY PROGRAMS - UNDERGRADUATE						
Conservation Law Enforcement	BIO/CRM	18 to 19	No	1	4	8
Environmental Education	BIO/GGP	14 to 16	No	5	10	4
Foundations of Pharmaceutical Science	CHM/BIO/BMS	16 to 18		--	5	7
INTERDISCIPLINARY PROGRAMS - GRADUATE						
Science Content	BIO/CHM/GGP/PAMS	18		--	--	--

Appendix 5 – Peer-reviewed publications and publications/presentations with student co-authors

Calendar Year	2015	2016	2017	2018	2019
Department	#Contributions	#Contributions	#Contributions	#Contributions	#Contributions
	Value	Value	Value	Value	Value
BIO	24	29	31	27	26
CHM	15	9	13	17	21
CSC	1	2	3	16	5
EGR	1	0	1	5	1
GGP	20	15	17	22	16
HL	4	5	4	6	7
MTH	8	8	12	17	7
PAMS	20	26	28	28	19
Total by COLUMNS	93	94	109	138	102

*The table above does not include peer-reviewed proceeding publications in computer science for 2019.

The tables below indicate the number of students listed as co-authors of publications and presentations.

2019 data

	Publications		Presentations	
	Undergraduate	Graduate	Undergraduate	Graduate
Department of Biology	5	11	53	96
Department of Chemistry	7	18	8	8
Department of Computer Science	2	3	0	0
Department of Geography, Geology, and Planning	3	10	35	48
Department of Hospitality Leadership	0	4	3	0
Department of Mathematics	3	1	0	0
Department of Physics, Astronomy, and Materials Science	5	0	7	0
Engineering Program	0	0	0	0

2018 data

	Publications		Presentations	
	Undergraduate	Graduate	Undergraduate	Graduate
Department of Biology	1	25	49	110
Department of Chemistry	3	22	11	15
Department of Computer Science	0	6	9	2
Department of Geography, Geology, and Planning	1	2	26	45
Department of Hospitality Leadership	0	1	11	2
Department of Mathematics	2	3	2	0
Department of Physics, Astronomy, and Materials Science	7	3	1	0
Cooperative Engineering Program	2	0	2	0

Appendix 6 - Scholarship Dollars Distributed

2019-2020 scholarship numbers (these are endowed scholarships with the foundation)

Department Scholarship #'s	Scholarships Awarded	Total Award Amount
Biology	12	\$6,244
Chemistry	28	\$31,850.00
CNAS- Biology/Chemistry Joint	2	\$2,000.00
College of Natural and Applied Science	40	\$39,600.00
Computer Science	14	\$8,183.30
Geography, Geology & Planning	8	\$10,200.00
Hospitality Leadership	15	\$10,600.00
Mathematics	36	\$37,380.00
Physics, Astronomy & Materials Science	13	\$18,000.00
TOTALS:	168	\$164,057.30

2018-2019 scholarship numbers

Department Scholarship #'s	Scholarships Awarded	Total Award Amount
Biology	22	\$ 11,950.00
Chemistry	11	\$ 11,400.00
CNAS- Biology/Chemistry Joint	1	\$ 1,000.00
College of Natural and Applied Science	35	\$ 35,250.00
Computer Science	11	\$ 6,133.12
Geography, Geology & Planning	11	\$ 11,200.00
Hospitality Leadership	12	\$ 7,325.00
Mathematics	28	\$ 29,000.00
Physics, Astronomy & Materials Science	15	\$ 15,500.00
TOTALS:	150	\$ 126,758.12

Appendix 7 – CNAS Faculty/Staff

2020 (FA)	Tenured/tenure-track Faculty in CNAS	Instructors/Lab supervisors
BIO	19.0 FTE 18.5 FT + Head	5/0
CHM	15.5 FTE 15 FT + Head	3/1
CSC	7.5 FTE 7 FT + Head	0/0
GGP	16.5 FTE 16 FT + Head	4/0
HL	5.5 FTE 5 FT + Head	2/0
MTH	22 FTE 21.5 FT + Head	11/0
PAMS	10.5 FTE 10 FT + Head	1/1
EGR	6.5 FTE 2 FTE MSU, 4 + Director MO S&T	1/1 (MSU)

Appendix 8 – Credit Hour Production

Although number of majors and number of graduates are important, it is also important to note credit hour production.

Calendar Year (SP/SU/FA)	2014	2015	2016	2017	2018	2019
	Credit Hours	Credit Hours	Credit Hours	Credit Hours	Credit Hours	Credit Hours
Agriculture	12,991	14,156	16,245	16,892	16,357	15,844
Arts & Letters	94,977	97,399	102,112	103,230	104,554	101,958
Business	100,030	106,171	108,149	110,736	113,386	113,994
Education	35,250	37,001	39,031	40,799	40,511	42,271
Health & Human Services	86,817	87,506	90,905	93,661	93,251	90,741
Humanities & Public Affairs	79,473	82,330	84,578	86,056	83,522	77,281
Library Science, Dept of	237	118	104	79	55	66
Natural & Applied Sciences	87,435	89,271	95,135	93,825	90,697	86,819
Undergraduate College/Provost	8,046	9,175	9,697	9,544	9,047	8,062

Credit hour production (total)	CY2016	CY2017	CY2018	CY2019
Biology	17,484	18,150	18,868	18,833
Chemistry	18,335	18,429	18,152	17,284
Computer Science	4,322	4,332	5,025	5,157
GGP	15,613	15,417	14,104	12,742
Hospitality Leadership	4,216	4,240	4,051	3,435
Mathematics	24,870	23,607	21,918	19,565
PAMS	8,888	8,337	8,325	8,361

Appendix 9 – TA/GA Allocations

Department	FY19 TA Allocations	
BIO	\$267,589	Funds 25-30 TA's
CHM	\$156,921	Funds 14.5-17.5 TA's
CSC	\$60,000	Funds 6-7 TA's
GGP	\$162,810	Funds 15-18.5 TA's
HL	\$18,000	Funds 2 TA's
MTH	\$128,027	Funds 12-14.5 TA's
PAMS	\$137,418	Funds 12-15.5 TA's
MNAS	\$48,000	Funds 4.5-5.5 TA's

Additional TA's are funded by external funds obtained by faculty and staff in CNAS.

Appendix 10 - Student Accomplishments in CNAS

Student Accomplishments 2019

January 28, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/01/28/undergraduate-research-showcased-at-conference/> Cullen Horstmann and Onika Olsen (Dr. Kim); BIO Majors; presented research at The Arkansas IDeA Network of Biomedical Research and Excellence

February 6, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/02/06/biology-student-wins-thesis-competition-works-on-phd/> Angeline Rodriguez (Dr. Lupfer); BIO major; won the 2019 Distinguished Thesis Competition

February 25, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/02/25/students-study-yeast-to-cure-diseases/> Cullen Horstmann, Deborah Ehie, Jared Smothers, Vy Nguyen, and Mya Ly (Dr. Kim); BIO; presented at the Midwest Yeast Meeting in November at Northwestern University in Evanston, Illinois.

March 8, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/03/08/women-in-stem-mathematics-edition/> Sabrina Klement; MTH; attended the Nebraska Conference for Undergraduate Women

March 16, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/03/16/biology-student-awarded-for-student-achievement-and-presentation/> Jeff Williams (Deb Finn); BIO; was awarded the Student Achievement Award and Best Student Platform Presentation from the Missouri Chapter of the American Fisheries Society (MOAFS)

April 26, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/04/26/biology-bears-find-a-new-home/> A dozen biology students go on to start graduate schools.

May 8, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/08/keeping-minorities-in-stem-fields/> Several undergraduate and graduate students created a chapter of the Louis Stokes Alliance for Minority Participation (LSAMP) and attended the Emerging Researchers National (ERN) conference in February. Anthony Grate (Dr. Day Ligon) a Wildlife Biology major won best poster presentation.

May 11, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/11/save-the-streams-one-student-at-a-time/> GGP students won top prize at stream conference.

May 14, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/14/chemistry-students-are-causing-a-reaction/> Several chemistry students presented at a conference in Orlando, Florida; one student went home with an award.

May 15, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/15/connecting-through-geography/> Students attended geography conference, obtaining awards. Miranda Jordan was recognized at the conference and won the graduate student paper award. Daniel Pearce ('15) also attended the conference.

May 19, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/19/ggp-students-present-at-conference/> Several GGP Students and staff presented research at the Geological Society of America meeting in Manhattan, KS.

May 24, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/24/always-learning-science-edition/> Missouri Academy of Sciences Annual Meeting. Several CNAS students who attended presented their research.

May 8, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/08/keeping-minorities-in-stem-fields/> Four students presented at the MOLSAMP conference and Anthony Grate (Wildlife biology major) won first place

May 11, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/11/save-the-streams-one-student-at-a-time/> Students (and faculty) presented at the UMSRS symposium and students Kayla Coonen and Hannah Adams were co-first place winners for best poster.

May 14, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/14/chemistry-students-are-causing-a-reaction/> Eight chemistry students presented at the National American Chemical Society Meeting, Koby Ljunggren won an award (Outstanding Student Poster Award in the Physical Chemistry division)

May 15, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/15/connecting-through-geography/> Miranda Jordan (GGP graduate student) won the Graduate Student Paper Award hosted by the Geomorphology Specialty Group of AAG (American Association of Geographers)

May 19, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/19/ggp-students-present-at-conference/> More than a dozen students attended the Geological Society of America meeting – each presenting their research

May 24, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/24/always-learning-science-edition/> Students from Biology and Engineering attending the Missouri Academy of Science meeting and several of them presented research at the meeting

May 26, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/05/26/college-of-business-alumnus-talks-to-computer-science-majors/> CSC majors attend presentation by College of Business alumnus and vice-president of company that recruits computer science majors.

June 4, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/06/04/msu-alumnus-wins-graduate-student-of-the-year/> MSU **ALUMNI** Adedamola Opalade recently won the Golden Torch Award from the National Society of Black Engineers.

June 25, 2019 https://blogs.missouristate.edu/cnas-newswatch/2019/06/25/pams-students-tour-nasa/?utm_source=feed&utm_medium=feed&utm_campaign=feed PAMS Student tour NASA; escorted by Dave Cornelison and Tig Besara. (April 2019)

July 1, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/07/01/making-batteries-more-sustainable/> Thomas Callaway presented master's thesis research on batteries at Materials Research Society conference. Advisor: Saibal Mitra (April 2019)

July 21, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/07/21/stay-close-learn-a-lot/> Chemistry students attended and two presented at Missouri Inorganic Day conference. Led by Nick Gerasimchuk (April 2019)

April 26, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/04/26/biology-bears-find-a-new-home/>
A dozen biology students go on to start graduate schools.

June 25, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/06/25/pams-students-tour-nasa/> Physics students visit NASA

July 1, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/07/01/making-batteries-more-sustainable/>
Thomas Callaway (Materials science grad student) presented research at the Materials Research Society Spring Meeting

July 21, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/07/21/stay-close-learn-a-lot/> Several students attended the Missouri Inorganic Day conference with two of them presenting posters

July 27, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/07/27/biology-students-present-win-award/>
Two students attended the Annual Meeting of the Southwestern Association of Naturalists (SWAN) and gave presentations – Kammie Voves won a Howard McCarley Student Research Award (gave funding for research support)

August 29, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/08/27/engineering-student-works-to-keep-freshwater-safe/> Erin Bereyso (Civil Engineering) attended the World Environmental and Water Resources Institute (ERWI) and presented a poster on her research – winning second place

October 22, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/10/22/saving-turtles-one-conference-at-a-time/> Students/Faculty/Alumni attended the Turtles Survival Alliance Conference and several of them presented research there – Anthony Grate received the best student poster award

November 4, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/11/04/biology-student-wins-grant-money/> Kammie Voves (Biology) was awarded a grant from Sigma Xi to help with her research

November 13, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/11/13/biology-students-present-at-annual-midwest-yeast-meeting/> Several Biology students attended the Midwest Yeast Meeting and some of them presented research.

November 20, 2019 <https://blogs.missouristate.edu/cnas-newswatch/2019/11/20/sage-muttel-award-winning-researcher-student/> Sage Muttel (Geology grad student) presented at the American Association of Petroleum Geologists Student Expo and won first place for her presentation – among other recent awards.

December 6, 2019 [Biology student works toward a cure](#), Husref Rizvanovic (Dr. Kyoungtae Kim (advisor)), attended the American Thyroid Association's annual conference and presented research about thyroid cancer – worked with Dr. Johnson Thomas a Mercy doctor and section chair in endocrinology.

December 9, 2019 [Falling in love with hospitality leadership, Springfield](#) – Alum Diana Vargas and her experience with Hospitality Leadership

December 14, 2019 [Alumni, students, faculty gather at geology conference](#) – Several graduate and undergraduate students went to the Annual meeting of the Geological Society of America and presented their research.

December 17, 2019 [Alumni work on drug delivery systems](#) – Allison Freese and Celia Garcia-Hernandez (both Chemistry Alumni) recently worked on a new system of drug delivery. Dr. Adam Wanekaya was their advisor

December 21, 2019 [Managing your hospitality leadership career](#)

December 23, 2019 [Biology students take home two top awards at mammal conference](#) – Susan Anderson (works with Drs. Chris Lupfer and Tom Tomasi) and Paige Harman (works with Dr. Sean Maher) attended the Central Plains Society of Mammalogists Conference (Oct 12, 2019) – and both took home awards. Anderson received the award for best undergraduate oral presentation and Harman received the award for best undergraduate poster.

February 21, 2020 [Brightening the horizon of the sciences through star research and female empowerment](#) Kali Shoaf (PAMS Senior) attended the Conference for Undergraduate Women in Physics and received the title of “Best Physics” for her conference presentation. Shoaf works with Dr. Mike Reed.

February 28, 2020 [Fishing for results through aquatic ecosystem research](#) Biology students Alexandria Beezel and Ethan Rutledge attended the 2020 Southern Division-American Fisheries Society and both presented their research. Both work in the lab of Dr. Quinton Phelps.

March 5, 2020 [Shaping biology research by the dozen](#) Several biology students attended the Missouri Natural Resources Conference and presented their research.

June 2, 2020 [Breeding the bite for survival](#) Ashley Gagnon (Biology graduate student) received the Howard McCarley Student Research Award from the Southwestern Association of Naturalists.