UMKC Department of Chemistry Profile 2018-2019

The Mission of the Department of Chemistry is to create a positive, inclusive environment that supports student learning, research, community and professional engagement for future chemists, scientists, educators, health science, and other professionals.

The Vision of the Department of Chemistry is to grow as a regional leader in the field of chemistry education and research through increased enrollment, more tenure track faculty, and enhanced resources.

Organization

The Chemistry Department is a unique unit that promotes the professional development of Faculty, Staff, and Students operating to prove our mission and vision, while adhering to the American Chemical Society guidelines.

Chemistry TT Faculty

1. Keith R. Buszek
2. Xiaobo Chen
3. Jerry R. Dias
4. Andrew J. Holder
5. Kathleen V. Kilway
6. Shin Moteki
7. Nathan Oyler
8. Zhonghua Peng
9. J David Van Horn

Chemistry Emeritus Faculty

1. James R. Durig
2. Eckhard Hellmuth
3. Yanching J. Jean
4. Charles Wurrey

Chemistry NTT Faculty

1. Paul Barron
2. Andrea Drew Gounev
3. Todor Gounev
4. Lena Hoober-Burkhardt

Staff

1. Michael Sykora
2. John Whitchurch
3. Asia Williams

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Students

1. Undergraduate Majors in Bachelor of Arts in Chemistry
2. Undergraduate Majors in Bachelor of Science in Chemistry
3. Undergraduate Chemistry Minors
4. Graduate Program Masters of Science in Chemistry
5. Graduate Program Interdisciplinary PhD Coordinating Discipline Chemistry (Primary Unit)

DEGREE PROGRAM	FS13	SP14	FS14	SP15	FS15	SP16	FS16	SP17	FS17	SP18
Chemistry (HC)	**326**	**331**	**319**	**309**	**290**	**292**	**278**	**275**	**290**	**269**
Chemistry BA	*229*	*233*	*229*	*232*	*210*	*213*	*196*	*196*	*204*	*191*
Chemistry BS	*97*	*98*	*90*	*77*	*80*	*79*	*82*	*79*	*86*	*78*
Chemistry Minor	**180**	**211**	**251**	**251**	**329**	**351**	**424**	**451**	**548**	**602**
Chemistry MS	**7**	**6**	**6**	**6**	**7**	**6**	**6**	**7**	**4**	**4**
Chemistry										
Chemistry Primary Discipline	*27*	*23*	*23*	*19*	*19*	*16*	*18*	*15*	*18*	*15*
Chemistry Co-Discipline	*43*	*41*	*40*	*40*	*36*	*39*	*37*	*37*	*37*	*37*

DEGREE PROGRAM	SS15	FS15	SP16	AY16	SS16	FS16	SP17	AY17	SS17	FS17	SP18	AY18
Chemistry (Undergrad SCH)	1176	5069	4781	11026	1124	5197	4767	11088	1262	5130	4718	11110
Chemistry (Graduate SCH)			24	24	3	15	36	54	3	24	21	48

The Chemistry Department Faculty explicitly affirms that they maintain their organizational identity and within any College and or School, the department must remain as stated below.

Department of Chemistry remain indefinitely as a unified organization.

- ✓ Operational Policies – administrative, fiscal, and other operational procedures.
- ✓ Current Chair
- ✓ Current Department Committees, Structure, Organizational Chart
- ✓ Current Promotion and Tenure criteria and procedures
- ✓ Current Process for Annual Evaluations – Faculty workload document
- ✓ Current Catalog
- ✓ Current University Committee Assignments
- ✓ Department of Chemistry appeals support for 3 full-time Assistant Professor positions for the next 3 years.
- ✓ Department of Chemistry appeals support for a full-time Office Support Assistant position.

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The FTT Assistant Professors generally teach the following courses CHEM 115, 211,212, 320, 321 and 322 courses with enrollments of 26 – 290 students.

1.) Number of Majors, Minors, Masters, PhD, SCH 5 Year Trend

AY	Number of Majors (Primary)	Number of Majors (All)	Number of Majors (All) FT
16/17	278/266	311/307	23.7
15/16	290/292	331/330	23.6
14/15	319/309	365/359	24.1
13/14	326/331	375/382	27
12/13	307/339	368/410	25.9

AY	Undergraduate Degrees Awarded	AY	SCH/FT Faculty
16/17	96	16/17	813
15/16	85	15/16	820
14/15	109	14/15	774
13/14	106	13/14	845
12/13	101	12/13	771

AY	Number of Minors/5 YR Trend	AY	Masters Students/5 YR Trend
16/17	393	16/17	8/9
15/16	325	15/16	7/6
14/15	244	14/15	6/6
13/14	179	13/14	7/6
12/13	92	12/13	7/5

AY	PhD Students - Discipline	PhD Students Co-Discipline
15/16	19/16	36/38
14/15	23/19	39/40
13/14	25/23	40/39
12/13	26/30	48/49

2.) Programs housed in department

Program Name	No. Students AY 13/14	No. Students AY 14/15	No. Students AY 15/16	No. Students AY 16/17
Bachelor of Arts (BA)	229/233	229/232	210/213	219/216
Bachelor of Science (BS) - ACS	97/98	90/77	80/79	82/84
Masters	7	6	7	9
IPhD	23	19	16	16

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3.) Service/Required (*) Courses

Course Name	No. Students AY 13/14	No. Students AY 14/15	No. Students AY 15/16	No. Students AY 16/17
CHEM 111: Physical Basis Chem(3CH)	28	21	23	32
CHEM 115: Elements of Chem (4CH)	110	101	105	104
CHEM 115L: Elements of Chem Lab (1CH)	102	97	101	95
CHEM 206: Human Nutrition (3CH)	269 (46)	215 (52)	220 (41)	202 (41)
CHEM 211: General Chem (4CH)*	577 (40)	579 (50)	581 (54)	600 (43)
CHEM 211L: Experimental Gen Chem Lab (1CH)*	535 (37)	521 (43)	536 (45)	552 (31)
CHEM 212R: General Chem II (4CH)*	407 (38)	381 (37)	410 (41)	380 (49)
CHEM 212LR: General Chem II Lab (1CH)*	383 (35)	355 (26)	390 (30)	386 (58)
CHEM 320: Elem Organic Chem (4CH)	82 (38)	78 (51)	76 (49)	76 (60)
CHEM 320L: Experimental Organic Chem (1CH)	81 (29)	73 (45)	74 (48)	72 (49)
CHEM 321: Organic Chem I (3CH)*	307 (33)	335 (25)	300 (30)	303 (35)
CHEM 321L: Organic Chem I (1CH)*	266 (25)	285 (21)	242 (23)	239 (30)
CHEM 322R: Organic Chem II (3CH)*	246 (29)	258 (31)	274 (23)	265 (23)
CHEM 322L: Organic Chem II Lab (1CH)*	235 (24)	219 (22)	237 (16)	241 (23)

() Enrollment in summer sessions following AY; SS14, SS15, SS16, SS17

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The Department of Chemistry offers an American Chemical Society (ACS) approved and accredited Bachelor of Science in Chemistry degree program, which our majors receive upon the completion of the requirements. UMKC and Rockhurst University have the only ACS approved programs in the greater Kansas City area. The program bullet points are listed below.

https://www.acs.org/content/acs/en/about/governance/committees/training/acsapproved.html

ACS Approval Program

ACS Promotes excellence in chemistry education for undergraduate students through approval of baccalaureate chemistry programs. ACS approved programs offer a broad based and rigorous chemistry education that gives students intellectual, experimental, and communication skills to become effective scientific professionals.

Benefits of an approved program

- Institutions with an ACS approved chemistry program attract top high school talent.
- Approved departments are staffed by accomplished faculty, containing a modern and well-maintained infrastructure, and provides a coherent chemistry curriculum
- Employers find graduate of approved programs to be better prepared for technical employment.
- Approval process provides a mechanism for department program evaluation, in order to identify areas of strengths and opportunities for change, and leverage support from their institutions and external agencies.

GUIDELINES FOR PROGRAM APPROVAL AND STUDENT CERTIFICATION

1. Goals of Program Approval and Student Certification
2. Institutional Environment
3. Faculty and Staff
4. Infrastructure
5. Curriculum
6. Undergraduate Research
7. Development of Student Skills
8. Program Self-Evaluation
9. Certification of Graduates

ACS Guidelines for Bachelor's Degree Programs (pdf)

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Health and Safety

It is critical that the Chemistry Department upholds the guidelines of health and safety listed Chemical Management Plan, set forth by the Environmental Health & Safety (EHS) Department, in cooperation with the Region 7 EPA. The plan contains the approved treatment protocols for laboratory neutralization of accepted hazardous materials. Developed by EHS, to ensure the safe and proper use of hazardous and nonhazardous chemicals and to comply with applicable governmental regulations addressing the disposal of these chemicals. In addition, it was designed to foster waste minimization, and to provide the faculty and the staff with a management program to reduce the potential for accidents involving hazardous chemicals and/or wastes.

https://www.umkc.edu/finadmin/ehs/documents/ChemicalManagementPlanWord06202016.pdf

Elements of the CMP include:

- A procedure for identifying potential or actual hazardous chemicals or wastes
- A procedure for periodic reexamination of those hazardous chemicals or wastes identified by the procedure in (a.) above as well as a systematic method for identification and evaluation of any new potential or actual hazardous chemicals or wastes
- Procedures for labeling, and inventorying hazardous chemicals or wastes
- A procedure for identification and training of personnel directly responsible for ensuring that (a.), (b.), and (c.) are implemented
- A procedure for monitoring, recording, and reporting compliance with the CMP
- A procedure by which information generated by the CMP is provided to the persons performing waste analyses each element is addressed as part of the complete CMP in the following paragraphs.

Research

Our research spans from synthetic methodology development to total synthesis of biologically active molecules, from fundamental studies of organic, inorganic, and polymeric materials to their applications as sustainable energy materials and biomedical materials, from theoretical and computational studies to spectroscopic explorations

Research faculty continue to gain national and international attention by performing cutting edge, scientific research that leads to real-world applications. Our department is small enough to facilitate mentorship while still producing renowned research across various disciplines.

Part of UMKC's mission as a research institution is to engage students in research projects. We are proud of the fact that our undergraduate chemistry students are able to enhance their college experience by participating in research projects.

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Strategic Planning Goals

GOAL A- Excellence in Graduate Education

Strategies	Actions
1. Enhance Research	• Faculty Development • Mentoring • Time/Support • Bring in more research active faculty
2. Expand resources	• Diversify resources • Marketing of the Department • Increase number of GTAs (for larger classes) • Reduce workload
3. Professional Development for Students	• Grant writing • Professional Association participation • Skills workshops • Presentation proposal training
4. Career development of graduate students	• Identify specialization interest • Mentoring • Resume/Interview skills • Job fairs

5. GTA development and support	• Increase GTA opportunities
	• Opportunities for supplemental salaries.
	  ○ Salaries should be supplemental (i.e. RA salaries)- check Physics Department
	  ○ Possibly scholarships
	• Expand 5611 to improve students' capabilities for succeeding
	  ○ Requiring students to take course 3 times during the first year, with a presentation
	  ○ Have committee run the course to monitor students' progress
	• Keep students working towards academic goals
	• Share responsibility for creating program, research (those faculty members on the Plan of Study committees for students)
	• Increase contact between committee and graduate students
	• Implement Graduate Instrumental Class taken after undergraduate level instrumental course
	• Allow two lab sections that qualify as work hours instead of three

6. RA development and support	• Provide information and guidance for grants and travel funding • Bring in more research active faculty • Recommend department research event once a year

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Goal B: Growing Excellence in Undergraduate Programs

Strategies	Actions

1. Enhance Bachelors Curriculum	• Explore Specialties/Emphasis/Interest areas with BA/BS
	• Ensure Faculty Review/oversight/accountability
	• Consult with Professional Schools and local business communities
	• Conduct student satisfaction surveys
	• Explore Combined Chemistry BS/MS degree
	  ○ MDHE Approval needed.
	• Explore one-year certificate program (15-18 credits) in Lab Safety/Lab Management for students who are done with CHEM BA but still trying to get into medical or dental programs
	  ○ MDHE Approval needed.
	• Reinvigorate Chemistry Club
	• Reinstate Honors General Chemistry as 1 semester course (5 credits, CHEM 211 and 212R with 2 credits, CHEM 211L and 212LR) or 2 semesters.
	• Explore ways to reinstate recitation with general chemistry.
	• Consider making Lab Safety (CHEM 311) a required course for all or at least required component of all lab courses.

2. Expand/review online curriculum possibilities	• Review of potential opportunities
	  ○ CHEM 206-on-going
	  ○ CHEM 115/115L: Home lab kits?
	  ○ CHEM 390
	  ○ Other?
	• Work with UMKC Online program
	• Collect student input to know needs

3. Enhance undergraduate research opportunities	• Explore opportunities within the Dept. • Engage community regarding research opportunities/internships
4. Support diversity recruitment and retention	• Work with admissions and recruitment • Engage in minority high school/transfer recruitment • Work with area organizations like the Hispanic Chamber of Commerce, Latinos of Tomorrow, Inroads, the UMKC Diversity and Inclusion Office • Mentoring
5. Compliance with ACS for ACS-approved BS degree	• Acquire electrochemical instrumentation for undergraduate use and integrate in CHEM 341WI, 345R, and/or 437WI. • Utilize the Assessment Plan we are currently undertaking to explore the rigor across same courses (semester to semester and semester to summer).

	• Develop criteria for students who conduct undergraduate research for credit (CHEM 399 or 499) to include: • Standardize number of hours in lab per week per credit hour enrolled in (i.e., 3 hours per week in lab for each credit enrolled in). • Require the submission of a final research paper that utilizes the ACS Committee on Professional Training "Preparing a Research Report" as the standard for paper design. • Develop a standard rubric that is used to assess the student's final research report. • Utilize UMKC Writing Studio. • Require final paper and rubric to be submitted to Department for ACS Report. • Ensure compliance with the ACS's MSN Requirement by one of the following: ○ Remove "Upper Level Elective from CHEM-BS and require CHEM 471 (Introduction to Polymer Chemistry) instead-May cost us double majors in Biology and Physics. • Redesign CHEM 367 to include 2 of the required topics. May also redesign CHEM 341WI, 382, 442R to include lecture and lab materials in these areas.

GOAL C- Faculty and Staff Development/Department Marketing

Strategies	**Actions**

1. Professional Development for New Faculty	• Improve the communication regarding the expectations of new faculty
	• Develop a "new faculty" manual which provides both department and university resources
	  ○ Teaching and mentoring graduate students
	  ○ University "Quicklinks" and FAQs
	  ○ Information about grant writing, FACET, UMRB, SEARCH, SYRUP
	  ○ Evaluation completion information and guidelines
	  ○ University and department academic timelines and due dates
	  ○ Syllabi content including syllabi examples
	  ○ MyVITA instructions
	  ○ Annual HR mandatory trainings
	  ○ New faculty "to-do list"
	  ○ EHS Chemical Safety Training
	  ○ Annual department training
	• Provide Pathway and Blackboard training

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2. Website/Marketing	• Add the Midwest ACS Meeting presentations and UMKC Donor Scholar event to website
	• Grad students will be taking pictures for a "grad student" page, which will list each student's research area/focus
	• Grad student organization may create their own page separate from the department website
	• Have faculty members oversee trips to conferences, etc. to advertise department research projects
	• Send fliers/newsletters to other institutions advertising department information, specifically research
	• Graduate Program
	  ○ Host "open house" for undergraduate students to learn more about graduate programs
	  ○ Partner with local industry members → collaboration allowing graduate students to become interns or assist with career searches
	  ○ Host career workshop for graduate students
	  ▪ Work with Career Services to have workshops during CHEM 5611 Seminar sessions
	  • Resume/CV writing
	  • Mock interviews/interview etiquette
	  • How to's: write/submit conference abstracts, presentations
	  ○ Require students take writing courses like the undergraduate program?

3. Department Research/Teaching Selling Points	• Understand who the department is
	• Highlight student, faculty, and staff achievements
	• Celebrate publications and awards related to Chemistry field
	• Celebrate graduates and new jobs add to website
	• Brag Sheet
	  ○ Develop elevator pitches for faculty
	  ○ Consider who is the audience?
	  ○ How is the sheet distributed?
	  ○ Distribute sheet every semester
	• Staff development
	  ○ Staff roles need to be understood
	  ○ Growth opportunities: staff assistance on department committees
	  ○ Advocate for staff changing role