

## Chemistry [CHEM]

**Cycles included in this report:**

Jun 1, 2018 to May 31, 2019

## **Program Name: Chemistry [CHEM]**

**Reporting Cycle: Jun 1, 2018 to May 31, 2019**

### **1 Is this program offered via Distance Learning?**

100% Traditional or less than 50% Distance/Traditional

### **2 Is this program offered at an off-site location?**

No

### **2.1 If yes to previous, provide addresses for each location where 50% or more of program credits may be earned.**

### **3 Example of Program Improvement**

2016-2017:

Data was absent for several years due to department head turnover. SLOs have been revised for the 2016-2017 assessment. Data will be collected and analyzed this year.

2017-2018:

Our data indicate that the students meet the critical thinking level in general chemistry as expected.

2018-2019:

The first example is that the department finally bought a desktop NMR for the students to use. This is vital for ACS accreditation. Another major and potentially important improvement is the purchase of three very important instruments, UCP-MS, HPLC, GS-MS with the help of Drew Foundation. These instruments are due to arrive by the end of 2019. These set of instruments vitalize the department, in not only attracting more students, but also in their training, and finding a placement and last but not least boost the retention of the faculty.

### **4 Program Highlights from the Reporting Year**

2016-2017:

Rebuilding the master plan. Benchmark year.

2017-2018:

Finally, our replacement hiring of the faculty is completed. Still, we have no working essential instruments, like NMR, GC-MS, etc., to train the students. We have been working on equipping the department.

2018-2019:

The department is still in the process of stabilizing. This year four faculty, one tenured, two tenure track and one instructor had left the department. We could replace only two positions so far. On the positive side, the purchase of new desktop NMR is complete and another large grant from foundation nearing the total of \$370,000 worth of equipment has been approved, which really transforms the department.

Students were assessed continuously throughout their senior year from various upper-level classes. Our results indicate that there is a marked increase in the understanding of the core chemical concepts from sophomore to senior year.

Next year onwards we will start assessing the outgoing students through a standardized exam.

### **5 Program Mission**

The mission of the Department of Chemistry & Physics includes the following components: (a) offering a quality educational program for all students enrolled in courses presented by the department, (b) providing an atmosphere conducive to (i) academic inquiry, (ii) the exchange of knowledge, and (iii) the advancement of knowledge through scientific research and/or other scholarly activities, and (c) providing service to the College of Science, the University, and the

community. The department seeks to broaden and enhance the educational experiences for all students enrolled in chemistry courses, to optimize the productivity of the faculty and staff, and to provide service to the academic and industrial communities and to the citizens of Southwest Louisiana.

## 6 Institutional Mission Reference

The department's mission mirrors that of the University in the provision of educational opportunities to students seeking a B.S. in Chemistry, and in providing support courses for students from other disciplines across the campus. In conjunction with the Department of Agricultural Sciences, we offer a M.S. in Environmental & Chemical Sciences. We conduct faculty-led research at both the undergraduate and graduate levels and interface many of our research efforts with local industries. The B.S program is approved by the American Chemical Society (ACS) and our program has received laudable reviews from them and from the Louisiana Board of Regents. Students are encouraged to present their research findings in oral or poster form in local, regional, and national meetings and student publication in scientific peer-reviewed journals is a departmental priority. Faculty serve as ad hoc consultants for a number of local industries, leveraging our technical expertise for the solution of industrial problems. In association with the Southwest Louisiana Crime Laboratory and SASOL North America we offer opportunities for students to intern in and conduct research in practical workplaces prior to graduation. Additionally, through collaboration with the Science Coordinator for Calcasieu Parish, we have a vibrant outreach program to local high schools and elementary schools aimed at sparking and sustaining student interest in science.

## 7 Assessment and Benchmark CHEM 301L Lab Report Grades

Assessment: Chemistry majors will demonstrate competence in the full range of classical experimental methodologies and techniques as demonstrated by lab report grades.

Student Learning Outcomes: At the completion of this course students should be able to:

- Predict and account for the physicochemical properties of organic compounds based upon their structures.
- Account for the behavior of organic compounds and the fates of organic reactions in terms of electronic, steric and orbital interactions.
- Describe preparative routes to the non-aromatic hydrocarbons, haloalkanes and alcohols/ethers.
- Discuss reaction pathways of the classes of organic compounds above.
- Draw reasonable curved arrow mechanisms for reactions profile and detail the SN and E reactions.

Benchmark: 70% of students will earn an average score of 80% on CHEM 301L Lab reports.

### Course Links

**CHEM301L [Organic Chemistry I Laboratory (Lab. 3, Cr. 1)]**

### Outcome Links

#### Lab Techniques and Methodologies [Program]

Graduates demonstrate competence in lab techniques and methodologies of experimental chemistry.

## 7.1 Data

Academic Year	Students with 80%		Benchmark met?
	#	%	
2017-2018	69/96	71%	Yes
2018-2019	77/91	82%	Yes

### Course Links

**CHEM301L [Organic Chemistry I Laboratory (Lab. 3, Cr. 1)]**

### 7.1.1 Analysis of Data and Plan for Continuous Improvement

2016-2017:

New assessment, an appropriate benchmark will be set after three years of data collection.

2017-2018:

These results mean that all these students had fulfilled the above mentioned SLOs. Although the benchmark has been met, a significant number of students (27 of them) have not been able to achieve 80% (B grade) or higher.

Improvement options:

The following steps would be taken  
To identify the reasons for low grades.

2018-2019:

There is a significant improvement in the grades and only 11 students out of 91 (12%) got 'C' grade.

Next plan is to improve the writing standards and create a rubric.

#### Course Links

**CHEM301L [Organic Chemistry I Laboratory (Lab. 3, Cr. 1)]**

### 8 Assessment and Benchmark CHEM 361 Lab Report Grades

Assessment: Chemistry majors will demonstrate competence in the full range of classical experimental methodologies and techniques as demonstrated by lab report grades.

Student Learning Outcomes have been measured as follows:

After completing this course, the student will:

1. Have the ability to use most laboratory techniques useful in the inorganic laboratory.
2. Have a working knowledge of synthesis separation, purification, and identification methods.
3. Demonstrate a working knowledge of Infrared Spectroscopy (IR).
4. Have the ability to interpret IR spectra.

Benchmark for CHEM 361 lab report score will be established after sufficient data is collected.

#### Course Links

**CHEM361 [Theory of Inorganic Chemistry (Lec. 3, Cr. 3)]**

#### Outcome Links

**Lab Techniques and Methodologies [Program]**

Graduates demonstrate competence in lab techniques and methodologies of experimental chemistry.

### 8.1 Data

Academic Year	Students with 80%		Benchmark met?
	#	%	
2017-2018	9/9	100%	Yes
2018-2019	8/8	100%	Yes

#### Course Links

**CHEM361 [Theory of Inorganic Chemistry (Lec. 3, Cr. 3)]**

#### 8.1.1 Analysis of Data and Plan for Continuous Improvement

2016-2017:

This is a new assessment, an appropriate benchmark will be set after three years of data collection.

2017-2018:

The data shows that all the students achieved the desired scores.

**Future Plan:**

A needed improvement would be to add more instrumentation techniques (now only IR is available) for identification and especially NMR spectroscopy, which is a required method for labs in all chemistry undergraduate programs.

**2018-2019:**

The department is on the verge of getting instruments. These new instruments will be used in the next cycle for this lab.

**Course Links**

**CHEM361 [Theory of Inorganic Chemistry (Lec. 3, Cr. 3)]**

**9 Assessment and Benchmark CHEM 303 Final Examination**

Assessment: Chemistry majors will demonstrate competence in sample preparation & analysis, data acquisition & analysis, chromatographic separations, optical atomic spectroscopy, and optical mass spectrometry as demonstrated by CHEM 303 Final Examination.

**Student Learning Objectives for CHEM 303:**

1. Understanding gravimetric and potentiometric analyses.
2. Understanding how chemical reactions are utilized for quantitative measurements of analytes.
3. Using relevant chemical equilibria (solubility, acid-base, complexation, redox) for solving chemical problems.
4. Assessing the accuracy, precision, and uncertainty of experimental data.
5. Performing and properly interpreting basic statistical tests.
6. Understanding and applying calibration strategies and their limitations.
7. Understanding of Mass Spectra, Chromatography, and Separation Techniques.
8. Understanding- FTIR, NMR, UV-Visible Spectroscopy, and Thermogravimetric Analysis Techniques.

Benchmark for CHEM 303 final examination score will be established after sufficient data is collected.

**Course Links**

**CHEM303 [Chemical and Instrumental Analyses (Lec. 1, Lab. 6, Cr. 3)]**

**Outcome Links****Chemical Instrumentation [Program]**

Graduates demonstrate competence in the use of chemical instrumentation.

**9.1 Data**

Academic Year	Students with 70%		Benchmark met?
	#	%	
2017-2018	—	100%	Yes
2018-2019	0	0	No

**Course Links**

**CHEM303 [Chemical and Instrumental Analyses (Lec. 1, Lab. 6, Cr. 3)]**

**9.1.1 Analysis of Data and Plan for Continuous Improvement****2016-2017:**

This is a new assessment, an appropriate benchmark will be set after three years of data collection.

2017-2018:

The objectives were accomplished in the course by covering the theoretical aspects of chemical instrumentation. The students were provided a rigorous background in analytical chemistry, with emphasis on instrumentation that the students would encounter in research and or industrial setting. Students were taught the different parts of an instrument and were tested over instrument parts with a visual examination. Heavy emphasis was placed on GC-MS and ICP-MS, as these instruments are commonly found in most workplaces.

Plan for continuous improvement:

Currently, we only have Spectronic 20 (spectroscopy) and an FTIR. A much-needed plan for improvement would be to add the actual instruments that are discussed in the lecture portion of the course so that the students can gain hands-on-experience for the usage and maintenance of instruments. This is necessary as there is only so much I can do without a hands-on approach for an instrumentation course.

2018-2019:

303 has not been offered in the year 2018-2019 due to the lack of instrumentation. The good news is, the department has acquired new instruments, HPLC, GC-S, ICP-MS, and NMR. Therefore 303 course will be offered in the coming spring.

#### Course Links

**CHEM303 [Chemical and Instrumental Analyses (Lec. 1, Lab. 6, Cr. 3)]**

### 10 Assessment and Benchmark CHEM 441 and 442 Oral Presentation Score

Assessment: CHEM 441 and 442 oral presentation score from rubric.

Student Learning Objectives:

At the completion of this course, students should be able to:

1. Write an informative abstract describing and referencing their presentation topic.
2. Organize a coherent, audio-visual (PowerPoint) presentation based on laboratory and/or literature research.
3. Present a comprehensive, well-paced scientific seminar to an audience of their peers.
4. Answer questions from a scientific audience based upon the presentation.
5. Write concise critiques of a seminar topic.
6. Evaluate and critique speakers.

Benchmark for CHEM 441 and 442 oral presentations will be established after sufficient data is collected.

#### Course Links

**CHEM441 [Seminar (Cr. 1)]**

**CHEM442 [Forensic Testimony (Cr. 1)]**

#### Outcome Links

**Scientific Methodology [Program]**

Graduates demonstrate competence in conducting scientific methodology.

### 10.1 Data

Academic Year	Students with 80%		Benchmark met?
	#	%	
2017-2018	14/14	100%	Yes
2018-2019	15/15	100%	Yes

#### Course Links

**CHEM441 [Seminar (Cr. 1)]**

**CHEM442 [Forensic Testimony (Cr. 1)]****10.1.1 Analysis of Data and Plan for Continuous Improvement [Approved]**

2016-2017:

The new assessment, an appropriate benchmark will be set after three years of data collection.

2017-2018:

Usually, the students present their undergraduate research finding as a part of the seminar. They are being assessed for their presentation skills along with with the demonstrative knowledge of the subject and the research findings. All the students scored a B or higher.

Plan for improvement:

Longer presentation times and more in-depth coverage of the subject material with a new rubric for detailed measurement of the student's performance are some of the proposed improvement plans.

2018-2019:

Students have been doing a great job in their presentations at McNeese. Next plan is to finalize the rubric and further improve the presentation standards.

**Course Links****CHEM441 [Seminar (Cr. 1)]****CHEM442 [Forensic Testimony (Cr. 1)]****11 Assessment and Benchmark CHEM 451 Research Paper [Approved]**

Assessment: Students will demonstrate ability to perform laboratory/computing research as well as literature research in their research project papers in CHEM 451.

Benchmark: 80% of program graduates will earn an average score of 80% or higher in CHEM 451. As well, 33.3% of program graduates will present their research findings at a state/regional/national scientific meeting and/or publish in a peer-reviewed journal.

**Course Links****CHEM451 [Undergraduate Research (Lab. 3-9, Cr. 1-3)]****Outcome Links****Scientific Methodology [Program]**

Graduates demonstrate competence in conducting scientific methodology.

**11.1 Data [Approved]**

Academic Year	Students with 80%		Benchmark met?	Students that presented findings		Benchmark met?
	#	%		#	%	
2016-2017	—	100%	Yes	—	100%	Yes
2017-2018	27/27	100%	Yes	14/14	100%	Yes
2018-2019	29/29	100%	Yes	12/12	100%	Yes

**Course Links****CHEM451 [Undergraduate Research (Lab. 3-9, Cr. 1-3)]****11.1.1 Analysis of Data and Plan for Continuous Improvement**

2016-2017:

Since the desired competency is met, we will continue to encourage students to become competent in research. Although the desired competency is met, it was significantly lower

than normal for the department. Neither faculty nor students presented at the Louisiana Academy of Sciences meeting in spring 2015. We will endeavor to continue to encourage students to present their findings in appropriate venues.

2017-2018:

All the graduating seniors have to take CHEM 451 as a part of their degree plan. At the end of the course, the students have to submit a research report that will be graded by their supervisor. All of them got an "A", which indicates that the student has succeeded in fulfilling the following SLOs.

1. Search and interpret the chemical literature
2. Function safely in the laboratory
3. Work independently and in a team
4. Approach a research problem
5. Design and execute experiments
6. Collect and interpret data
7. Write a research report

2018-2019:

Research is mandatory in chemistry. All the students will have to take this course. Most of them present their results in a seminar or other avenues. All the students had fulfilled the above SLOs.

We plan to streamline the reports and develop a digital repository in the future.

#### Course Links

**CHEM451 [Undergraduate Research (Lab. 3-9, Cr. 1-3)]**

## 12 Assessment and Benchmark Enrollment and Completers

Assessment: Enrollment numbers are based on the number of candidates that have declared Chemistry Education as their major and have turned in an EDUC 200 packet.

Benchmark: The EPP has set a goal to increase enrollment by 7% across programs each year from fall 2017 to fall 2021 to coincide with the MSU Strategic Plan goal concerning enrollment and recruitment.

#### Course Links

**EDUC200 [Entrance into Teacher Education (Cr. 0)]**

### 12.1 Data

Chemistry Education - Enrollment and Completer Data:

Academic Year	# officially enrolled with an EDUC 499 packet	# of completers in fall semester	# of completers in spring semester	Total # of completers
2017-2018	1	1	0	1
2018-2019	0	0	0	0

#### Course Links

**EDUC200 [Entrance into Teacher Education (Cr. 0)]**

### 12.1.1 Analysis of Data and Plan for Continuous Improvement

2017-2018:

- Department of Education Professions is up for CAEP site visit in spring 2017; therefore, faculty have been meeting in preparation.
- Program faculty meets at regular intervals throughout the year to discuss advising methods and program implementation.
- Program Faculty will continue to collaborate with local districts to strengthen our



program and prepare our teacher candidates to fully meet district needs.

2018-2019:

Data Analysis:

The benchmark was not met. There was a decrease from 1 to 0 students enrolled in the program from the previous year. The one candidate enrolled from the previous year completed the program within the 2017-2018 AY.

Plan for Continuous Improvement:

The goal for the 2019-2020 AY will be to increase student enrollment by 7%.

Recommendation for Successful Implementation of Plan for Improvement:

- Secondary and Chemistry faculty will participate in the Education Professions Advising Session after the 14th day of each semester to make connections with candidates and provide guidance for official acceptance into the program.
- Faculty will attend recruitment events such as recruitment fairs, the Sulphur Career Fair, Geaux Teach- Unlock Education, and will visit at least two local high schools with the purpose of recruiting for education programs.
- Promote Ed Rising in the local school districts to recruit to the education profession. Complete process to give credit for two education courses within the program for participation and completion of assessments in the Ed Rising High School Program.

#### Course Links

#### EDUC200 [Entrance into Teacher Education (Cr. 0)]

### 13 Assessment and Benchmark Field Experience Evaluation III (FEE Content)

Assessment: The Field Experience Evaluation Domain 5 measures the Content Specific Components related to teaching observations.

The FEE Scoring Scale is as follows: 1- Ineffective; 2- Effective: Emerging; 3- Effective: Proficient; 4- Highly Effective.

Benchmark: 90% of the candidates will score a 3.00 or higher on each element of Domain 5 (Content Specific Components) on the Field Experience Evaluation (FEE) Rubric.

Prior to 2017-2018, the benchmark was 100% of students will meet or exceed the benchmark of 2.00. The state of Louisiana sets the benchmark.

#### 13.1 Data

Chemistry Education - Content specific components on FEE III:

Component	Fall 2015			Spring 2016			Fall 2016			Spring 2017		
	#	Mean	Range	#	Mean	Range	#	Mean	Range	#	Mean	Range
5.1							1	4.00	4.00			
5.2							1	3.75	3.75			
5.3							1	4.00	4.00			
5.4							1	4.00	4.00			
5.5							1	3.75	3.75			
5.6							1	4.00	4.00			
5.7							1	4.00	4.00			
5.8							1	3.83	3.83			

Component	Fall 2017			Spring 2018			Fall 2018			Spring 2019		
	#	Mean	Range	#	Mean	Range	#	Mean	Range	#	Mean	Range
5.1	1	3.63	3.63	0	—	—	0	—	—	0	—	—



Technology	5l	Mean			4.00		4.00	
		Range			4.00		4.00	
		% Proficient or Higher			100%		100%	
Educational Materials		Mean			4.00			
		Range			4.00			
		% Proficient or Higher			100%			
Procedures	3k	Mean			3.00		4.00	
		Range			3.00		4.00	
		% Proficient or Higher			100%		100%	
Lesson "Hook"	8j	Mean			2.00		4.00	
		Range			2.00		4.00	
		% Proficient or Higher			0%		100%	
Pre-Planned (SEED) Questions	8i	Mean			1.00		4.00	
		Range			1.00		4.00	
		% Proficient or Higher			0%		100%	
Modeled, Guided, Collaborative, and Independent Practice	7k	Mean			2.00		4.00	
		Range			2.00		4.00	
		% Proficient or Higher			0%		100%	
Closure		Mean			1.00			
		Range			1.00			
		% Proficient or Higher			0%			
Formative/ Summative Assessment	6j	Mean			1.00		4.00	
		Range			1.00		4.00	
		% Proficient or Higher			0%		100%	
Relevance and Rationale	2j	Mean			3.00		4.00	
		Range			3.00		4.00	
		% Proficient or Higher			100%		100%	
Exploration, Extension,	1e	Mean			2.00		4.00	
		Range			2.00		4.00	
		%						

Supplemental		Proficient or Higher			0%		100%	
Differentiation	7j	Mean			1.00		4.00	
		Range			1.00		4.00	
		% Proficient or Higher			0%		100%	

	InTASC Standard		Fall 2018 N=0	Spring 2019 N=0	Fall 2019 N=	Spring 2020 N=	Fall 2020 N=	Spring 2021 N=
Essential Questions		Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Content Standards		Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Student Outcomes	4n	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Technology	5l	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Educational Materials		Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Procedures	3k	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Lesson "Hook"	8j	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Pre-Planned (SEED)	8i	Mean	—	—				
		Range	—	—				
		%						

Questions		Proficient or Higher	—	—				
Modeled, Guided, Collaborative, and Independent Practice	7k	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Closure		Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Formative/ Summative Assessment	6j	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Relevance and Rationale	2j	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Exploration, Extension, Supplemental	1e	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				
Differentiation	7j	Mean	—	—				
		Range	—	—				
		% Proficient or Higher	—	—				

#### 14.1.1 Analysis of Data and Plan for Continuous Improvement

2016-2017:

The candidate did not meet the benchmark in the following areas:

- Essential Questions
- Student Outcomes
- Lesson "Hook"
- Pre-Planned (Seed) Questions, Modeled, Collab, & Ind. Practice
- Closure
- Formative/Summative Assessment
- Exploration, Extension, Supplemental
- Differentiation

This student was not proficient in lesson planning. Continue to track students to determine if changes need to be made to the program to strengthen these areas. It is impossible to determine if any changes are needed from the results of one student.

2017-2018:

The benchmark was met. The candidate scored above the benchmark on all elements of the Lesson Plan rubric.



Instruction						3.55	3.25-4.00		
Component 3.1						3.46	3.38-3.63		
3.1.1	8f					3.38	3.38		
3.1.2	4c					3.38	3.38		
3.1.3	5e					3.63	3.63		
Component 3.2						3.47	3.25-3.75		
3.2.1	7a					3.25	3.25		
3.2.2	3j					3.75	3.75		
3.2.3	4f					3.25	3.25		
3.2.4	3d					3.63	3.63		
Component 3.3						3.69	3.50-4.00		
3.3.1	6d					3.50	3.50		
3.3.2	6a					3.63	3.63		
3.3.3	6d					4.00	4.00		
3.3.4	8b					3.63	3.63		
Domain 4: Professionalism						3.80	3.63-3.88		
Component 4.1						3.80	3.63-3.88		
4.1.1	9o					3.88	3.88		
4.1.2	9l					3.88	3.88		
4.1.3	9o					3.63	3.63		

Element	InTASC Standard	Fall 2017 N=1			Spring 2018 N=0		
		Mean	Range	%*	Mean	Range	%
Domain 1: Planning and Preparation		3.91	3.88-4.00	100%			
Component 1.1		3.91	3.88-4.00	100%			
1.1.1	4n	3.88	3.88	100%			
1.1.2	6r	4.00	4.00	100%			
1.1.3	2g	3.88	3.88	100%			
1.1.4	1b	3.88	3.88	100%			
Domain 2: The Classroom Environment		3.70	3.50-3.88	100%			
Component 2.1		3.72	3.63-3.88	100%			
2.1.1	3j	3.75	3.75	100%			
2.1.2	3d	3.63	3.63	100%			
2.1.3	3d	3.63	3.63	100%			
2.1.4	3d	3.88	3.88	100%			
Component 2.2		3.67	3.50-3.88	100%			
2.2.1	3c	3.63	3.63	100%			
2.2.2	3f	3.88	3.88	100%			
2.2.3	3f	3.50	3.50	100%			

Domain 3: Instruction		3.67	3.38-3.88	100%			
Component 3.1		3.63	3.63	100%			
3.1.1	8f	3.63	3.63	100%			
3.1.2	4c	3.63	3.63	100%			
3.1.3	5e	3.63	3.63	100%			
Component 3.2		3.78	3.75-3.88	100%			
3.2.1	7a	3.88	3.88	100%			
3.2.2	3j	3.75	3.75	100%			
3.2.3	4f	3.75	3.75	100%			
3.2.4	3d	3.75	3.75	100%			
Component 3.3		3.60	3.38-3.75	100%			
3.3.1	6d	3.63	3.63	100%			
3.3.2	6a	3.75	3.75	100%			
3.3.3	6d	3.63	3.63	100%			
3.3.4	8b	3.38	3.38	100%			
Domain 4: Professionalism		3.79	3.75-3.88	100%			
Component 4.1		3.79	3.75-3.88	100%			
4.1.1	9o	3.75	3.75	100%			
4.1.2	9l	3.75	3.75	100%			
4.1.3	9o	3.88	3.88	100%			

Element	InTASC Standard	Fall 2018 N=0			Spring 2019 N=0		
		Mean	Range	%*	Mean	Range	%
Domain 1: Planning and Preparation							
Component 1.1							
1.1.1	4n						
1.1.2	6r						
1.1.3	2g						
1.1.4	1b						
Domain 2: The Classroom Environment							
Component 2.1							
2.1.1	3j						
2.1.2	3d						
2.1.3	3d						
2.1.4	3d						
Component 2.2							
2.2.1	3c						
2.2.2	3f						
2.2.3	3f						



Domain 3: Instruction							
Component 3.1							
3.1.1	8f						
3.1.2	4c						
3.1.3	5e						
Component 3.2							
3.2.1	7a						
3.2.2	3j						
3.2.3	4f						
3.2.4	3d						
Component 3.3							
3.3.1	6d						
3.3.2	6a						
3.3.3	6d						
3.3.4	8b						
Domain 4: Professionalism							
Component 4.1							
4.1.1	9o						
4.1.2	9l						
4.1.3	9o						

\*% Proficient or higher.

### 15.1.1 Analysis of Data and Plan for Continuous Improvement

2016-2017:

The candidate exceeded the benchmark for all components.

2017-2018:

The candidate exceeded the benchmark for all components on the FEE rubric.

2018-2019:

Data Analysis:

There were no completers for the 2018-2019 AY, therefore there is no data to report.

Mentors, University Supervisors, and Secondary faculty will participate in professional develop focused on the FEE elements and will work to norm the tool and establish inter-rater reliability.

Plan for Continuous Improvement:

- Chemistry education faculty and secondary faculty will work to determine appropriate strategies for assessing learning and fostering higher order discussions.
- Methods courses will emphasize the expectations for student-led discussions in the classroom.

## 16 Assessment and Benchmark Teacher Candidate Work Sample

Assessment: The scoring scale for the Teacher Candidate Work Sample is: 1- Ineffective; 2- Effective: Emerging; 3- Effective: Proficient; 4- Highly Effective.

Benchmark: 80% of candidates will score a 3.00 or above on each of the elements on the Teacher Candidate Work Sample Rubric.

### 16.1 Data

## Chemistry Education - Teacher Candidate Work Sample (data from EDUC 333 and EDUC 412):

Criteria		Fall 2015 N=0	Spring 2016 N=0	Fall 2016 N=1	Spring 2017 N=0	Fall 2017 N=1	Spring 2018 N=0
Choice of Assessment	Mean			4.00		4.00	
	Range			4.00		4.00	
	% Proficient or Higher			100%		100%	
Pre-Assessment	Mean			4.00		4.00	
	Range			4.00		4.00	
	% Proficient or Higher			100%		100%	
Post-Assessment	Mean			4.00		4.00	
	Range			4.00		4.00	
	% Proficient or Higher			100%		100%	
Alignment of Lesson Evidence	Mean			4.00		4.00	
	Range			4.00		4.00	
	% Proficient or Higher			100%		100%	
Student Level of Mastery and Evaluation of Factors	Mean			4.00		4.00	
	Range			4.00		4.00	
	% Proficient or Higher			100%		100%	
Data to Determine Patterns and Gaps	Mean			4.00		4.00	
	Range			4.00		4.00	
	% Proficient or Higher			100%		100%	
Response to Interventions	Mean			4.00		4.00	
	Range			4.00		4.00	
	% Proficient or Higher			100%		100%	

Criteria		Fall 2018 N=0	Spring 2019 N=0	Fall 2019 N=	Spring 2020 N=	Fall 2020 N=	Spring 2021 N=
Choice of Assessment	Mean	—	—				
	Range	—	—				
	% Proficient or Higher	—	—				
	Mean	—	—				

Pre-Assessment	Range	—	—				
	% Proficient or Higher	—	—				
Post-Assessment	Mean	—	—				
	Range	—	—				
	% Proficient or Higher	—	—				
Alignment of Lesson Evidence	Mean	—	—				
	Range	—	—				
	% Proficient or Higher	—	—				
Student Level of Mastery and Evaluation of Factors	Mean	—	—				
	Range	—	—				
	% Proficient or Higher	—	—				
Data to Determine Patterns and Gaps	Mean	—	—				
	Range	—	—				
	% Proficient or Higher	—	—				
Response to Interventions	Mean	—	—				
	Range	—	—				
	% Proficient or Higher	—	—				

### 16.1.1 Analysis of Data and Plan for Continuous Improvement

2016-2017:

The candidate exceeded the benchmark for all criteria.

2017-2018:

The candidate exceeded the benchmark for all criteria on the Teacher Candidate Work Sample.

Secondary education faculty will identify ways to strengthen the TCWS assessment tool and revise the rubric to coincide with those expectations.

2018-2019:

There were no completers in the 2018-2019 AY, therefore, there is no new data to report.

Plan for Continuous Improvement:

The Teacher Candidate Work Sample is being replaced by the Teaching Cycle which provides specific expectations and increased rigor with scaffolded support to improve candidate abilities to evaluate student learning and plan for differentiated instruction.

## 17 Assessment and Benchmark Praxis Content and PLT Exam Data

Assessment 1: Praxis content exam is #5245 for Chemistry Education, Grades 7-12. This exam must be passed prior to student teaching. The passing score required by the state for 2017-2018 is 151.

Assessment 2: Praxis Principles of Learning and Teaching Exam is #5624 for Grades 7-12. The passing score required by the state for 2017-2018 is 157.

Benchmark 1: 90% of Chemistry Education majors will achieve a passing score on the Praxis Chemistry Education Exam (#5245) on the first attempt. Passing score set by the state is 151.

Benchmark 2: 80% of candidates will pass the Principles of Learning and Teaching, Grades 7-12 Praxis exam on the first attempt.

### 17.1 Data

#### Chemistry Education - Praxis Content #5245:

		Fall 2015	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018
#5245 Overall	Number	0	0	1	0	1	0
	Mean					161	
	Range					161	
	% Passed on 1st Attempt					0%	
#5245 Breakdown	Number					1	
Basic Principles of Matter and Energy; Thermodynamics	Mean					8	
	Range					8	
	Percentage Correct (14)					57%	
Atomic and Nuclear Structure	Mean					10	
	Range					10	
	Percentage Correct (12)					83%	
Nomenclature; Chemical Composition; Bonding and Structure	Mean					9	
	Range					9	
	Percentage Correct (15)					60%	
Chemical Reactions; Periodicity	Mean					16	
	Range					16	
	Percentage Correct (20)					80%	
Solutions and Solubility; Acid-Base Chemistry	Mean					13	
	Range					13	
	Percentage Correct (15)					87%	
Scientific Inquiry and Social Perspectives of Science	Mean					7	
	Range					7	
	Percentage Correct (12)					58%	
Scientific Procedures and Techniques	Mean					9	
	Range					9	
	Percentage Correct (12)					75%	

		Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
#5245 Overall	Number	0	0				
	Mean	—	—				
	Range	—	—				
	% Passed on 1st Attempt	—	—				
#5245 Breakdown	Number	0	0				
Basic Principles of Matter and Energy; Thermodynamics	Mean	—	—				
	Range	—	—				
	Percentage Correct (14)	—	—				
Atomic and Nuclear Structure	Mean	—	—				
	Range	—	—				
	Percentage Correct (12)	—	—				
Nomenclature; Chemical Composition; Bonding and Structure	Mean	—	—				
	Range	—	—				
	Percentage Correct (15)	—	—				
Chemical Reactions; Periodicity	Mean	—	—				
	Range	—	—				
	Percentage Correct (20)	—	—				
Solutions and Solubility; Acid-Base Chemistry	Mean	—	—				
	Range	—	—				
	Percentage Correct (15)	—	—				
Scientific Inquiry and Social Perspectives of Science	Mean	—	—				
	Range	—	—				
	Percentage Correct (12)	—	—				
Scientific Procedures and Techniques	Mean	—	—				
	Range	—	—				
	Percentage Correct (12)	—	—				

### 17.1.1 Analysis of Data and Plan for Continuous Improvement

2016-2017:

The candidate exceeded the benchmark.

2017-2018:

The benchmark was not met. The one completer from the 2-18-2019 AY did not pass the Praxis Content Exam on the first attempt. The two lowest areas of questions completed correctly were Principles of Matter and Energy (57%) and Scientific Inquiry (58%).

As the Chemistry Education professor(s) work with education faculty to redesign the

Chemistry Education Program to meet state residency requirements, they will also revisit the topics covered on the content Praxis exam to ensure the appropriate courses are a part of the program. Professors will also evaluate and include in the course sequence the time in the sequence where students would be most prepared to complete the Praxis content exam successfully.

2018-2019:

There were no completers for the 2018-2019 AY, therefore, there is no data to report.

Plan for Continuous Improvement:

- A faculty member in the Chemistry Education content area will take the Praxis content exam to determine appropriate topics for course content.
- Chemistry faculty will examine the coursework in the Chemistry Education program to determine where the topics indicated in the previous bullet are covered within the prescribed content courses.
- Based on courses above, faculty will determine the best time for candidates to take the Praxis Content Exam and include that recommendation in the advising process.

## 17.2 Data

Chemistry Education - Praxis Content #5624:

		Fall 2015	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018
#5624 Overall	Number	0	0	1	0	1	0
	Mean			181		180	
	Range			181		180	
	% Passed on 1st Attempt			100%		100%	
#5624 Breakdown	Number			1		1	
Students as Learners	Mean			20		13	
	Range			20		13	
	Percentage Correct (21)			95%		62%	
Instructional Process	Mean			15		15	
	Range			15		15	
	Percentage Correct (21)			71%		71%	
Assessment	Mean			13		10	
	Range			13		10	
	Percentage Correct (14)			93%		71%	
Professional Development Leadership and Community	Mean			13		11	
	Range			13		11	
	Percentage Correct (13)			100%		85%	
Analysis of Instructional Scenarios	Mean			7		15	
	Range			7		15	
	Percentage Correct (16)			44%		94%	

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		Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021
#5624 Overall	Number	0	0				
	Mean	—	—				
	Range	—	—				
	% Passed on 1st Attempt	—	—				
#5624 Breakdown	Number	0	0				
Students as Learners	Mean	—	—				
	Range	—	—				
	Percentage Correct (21)	—	—				
Instructional Process	Mean	—	—				
	Range	—	—				
	Percentage Correct (21)	—	—				
Assessment	Mean	—	—				
	Range	—	—				
	Percentage Correct (14)	—	—				
Professional Development Leadership and Community	Mean	—	—				
	Range	—	—				
	Percentage Correct (13)	—	—				
Analysis of Instructional Scenarios	Mean	—	—				
	Range	—	—				
	Percentage Correct (16)	—	—				

### 17.2.1 Analysis of Data and Plan for Continuous Improvement

2016-2017:

We collect the benchmark data, analyze and make continuous improvements.

2017-2018:

The benchmark was met. The completer (n=1) in the 2017-2018 AY passed the Praxis PLT on the first attempt.

Redesigned programs will recommend that candidates attempt the Praxis PLT once they have completed EDUC 203 and PSYC 261.

2018-2019:

There were no completers in the 2018-2019 AY, therefore, there is no data to report.

Plan for Continuous Improvement:

- Candidates will receive an 8-semester course sequence during advising indicating when to enroll in EDUC 203 and PSYC 261 (these two courses are content related to the Praxis PLT).
- Advisors will recommend candidates take the Praxis PLT once EDUC and PSYC 261 are successfully completed.
- Secondary education faculty will monitor pass rates of candidates in order to assure alignment and proper sequencing in the redesigned programs.





End of report