AUBURN UNIVERSITY
OFFICE OF ACADEMIC ASSESSMENT

Assessment Report - 2017

Graduate Certificate in Brewing Science and Operations

The micro and/or craft brewing industry has experienced huge growth in recent years with a corresponding interest at the hobbyist level. This program provides opportunities for those wishing to gain the theoretical knowledge and practical skills to pursue a career in the Brewing Industry or update their current brewing qualifications.

This program was developed and formally approved for delivery summer 2012. That said, the program did not officially admit its first cohort until the fall of 2014, graduating its first class of 15 students in the summer of 2015. The program consists of 18 credit hours spread across 6 three credit hour courses. Five of these courses are taken online via distance education, with the remaining course being an offsite practicum oriented experience. The program marries traditional educational approaches with real-world application leading to a state-of-the-art interactive learning experience.

The courses offered are listed below:

HOSP7106 (3)-The Business of Brewing
HOSP7116 (3)-Brewing Materials
HOSP7126 (3)- Science of Brewing I
HOSP7136 (3) - Science of Brewing II
HOSP7146 (3)-Facilities and Operations
HOSP7916 (3) Practicum in Brewing Science

The program mission is as follows - This program is designed to prepare candidates for entry into the malting, brewing and/or distilling industries.

Program and Student Learning Outcomes

1. **Specificity of Outcomes**

Feedback on last year's assessment report forced a complete rethink on the program's student learning outcomes. The recommendation received was as follows: *"The program might consider revising the statements with more precise learning verbs. Consider contacting the Office of Academic Assessment to discuss the list of outcomes for more detailed feedback"*. I am delighted to report that the Program Director met with a representative from the Office of Institutional Assessment for further insight and was able to share this with the faculty with a view to further developing the student learning outcomes for the program. The faculty met to discuss the feedback offered and took the committee's advice to revise and further develop all learning outcomes for the program. This led to the development of six additional learning outcomes. With that being said, the program now has one overarching Program Learning Outcome and a total of twelve Student Learning Outcomes; all of which contain precise learning oriented verbs. These were shared with the Office of Academic Assessment (OAA) for validation prior to actual adaptation for the program. The new list is as follows:

Program learning outcome:

- Graduates of the program will be satisfied that they are prepared for career entry in the commercial brewing sector

Student learning outcomes:

Upon successful completion of the program students will have the ability to:

1. Develop standardized recipes using primary and adjunct brewing ingredients.
2. Identify major beer styles and their characteristic ingredients.
3. Demonstrate knowledge of major factors used to assess ingredient quality, including alpha acid content, lovibond rating, and fermentable sugar content.
4. Recognize and understand properties of brewing materials & processes that affect flavor, aroma, mouthfeel, body, appearance, and alcohol content.
5. Implement the proper procedures to produce wort (unfermented beer).
6. Understand and explain the process of fermentation.
7. Display familiarity with the steps required to take beer from the end of fermentation through the packaging of the product.
8. Utilize analytical methods to determine beer quality and beer flaws - Bruce and Curt.
9. Create a robust vision, mission, and goals appropriate for the launch of a commercial craft brewery or expansion of an existing brewery.
10. Perform an accurate analysis of the craft brewing industry's competitive environment.
11. Conduct a comprehensive cost analysis associated with starting a new craft brewery.
12. Identify the key equipment used in a commercial craft brewery, and how that equipment functions, how it is maintained and how that same equipment is cleaned and sanitized.

2. Comprehensive Outcomes

The faculty believe that the revised list of SLO'S is both comprehensive and an accurate reflection of the current scope of the program and its intended mission, which is to prepare candidates for career entry in the commercial brewing sector. As indicated the faculty worked closely with a representative from the Office of Institutional Assessment to ensure that these outcomes align with the intent of the program.

At a national level the faculty continue to work with the: The American Brewers Guild (ABG}, The Brewers Association (BA} and The American Home Brewers Association (AHA}. Each of these bodies continue to express great interest in our program and its graduates. As shared in last year's report, each body was advised of our intention to develop the program and was asked for comment on our proposed curriculum model at the Graduate Certificate level. In all cases the corresponding feedback spoke to (1) a need for additional programs (2) support of our initiative and, (3) support for the curriculum model as proposed. Many of these supporting documents were submitted with the original program proposal.

Program faculty continue to work with faculty from other schools offering brewing or fermentation oriented programs at the industry's peak national event: The Craft Brewers Conference. I am pleased to report that an Educational Sub-committee has now been formed as an offshoot of the Brewers Association to represent the interests of all those engaged in brewing education, and our program has two representatives on this committee: Drs. Curt Bird and Julie Howe. The initial charge for this committee is the development of an accreditation standard in partnership with the Master Brewers Association of the America's. This will ensure educational outcomes and standards for all programs moving forward. Internationally, the program is still partnered with the Institute for Brewing and Distilling (IBD} in London.

As indicated, The IBD continue to be recognized globally as the peak professional and educational body in the brewing industry. I am happy to report that the IBD have undertaken a complete review of their educational product based upon feedback offered by Auburn and other programs internationally, and that as a consequence they will be rolling out a new educational standard that more closely aligns with our current program offering. Most interesting is their desire to include a business component to their professional certification program, something that Auburn has been very proud to offer as a central part of its program since inception.

Regionally, the faculty remain connected with the Alabama Brewers Guild who were also highly supportive of the development of the program and aided in the development of the curriculum. Over the last year the Guild has expressed interest in funding a scholarship to support student development, and have supported faculty with both outreach and a variety of scholarship initiatives.

One of the more unique features of the curriculum remains our relationship with the Oskar Blues Brewery out of Longmont, Colorado. Oskar Blues continues to support and part-fund our annual strategic offsite for all students and faculty at the front end of our program in August each year. They also continue to provide invaluable internship/practicum experiences to students who express and interest in working with them.

In summary, the faculty feel very assured that the new list of learning outcomes are relevant, vibrant and current.

3. Communicating Student Learning Outcomes

The faculty continue to meet annually to share and discuss assessment data in fall of each year. This meeting took place immediately following the Program Director's meeting with Katie Boyd from the Office of Academic Assessment (OAA) last fall. While the meeting focused on a variety of assessment data including student reaching evaluations, the annual exit survey of graduates and unsolicited feedback received from practicum supervisor reports, the number one agenda item related to the feedback received from the OAA pertaining to the 2016 assessment report. As shared, this led to the redevelopment of our then list of student learning outcomes and verbiage used to communicate each. The Program Director was able to share the feedback received from Katie and faculty worked on the development of a more comprehensive and relevant list of 12 student learning outcomes. As in previous years, constituent (students, industry and professional associations) group feedback was used to help faculty fine tune and update their various course offerings. For example, the inclusion of a new class on the intricacies and various safety aspects of kegging. Dr. Martin was able to invite a leading national authority on Keg Safety to campus for the purpose of video capture to support his facilities class. Similarly, Dr. Ketchen was able to visit with brewers at a variety of established and new and upcoming regional craft breweries to video capture feedback on their various business practices. This material was again incorporated into his Business of Brewing Class. Drs. Bird and Smith were able to host a number of additional laboratory classes over the course of the year, for all students engaged in their Science of Brewing Classes. Feedback offered by Brewers Guild prompted the Program Director to meet with a number of prominent regional brewers to discuss the development of a series of new courses that might serve the development of a new masters degree in brewing science at some point in the near future. All of these changes were made based solely upon student and industry feedback.

As with previous cohorts, all incoming students were apprised of the program and its student learning outcomes during the annual strategic offsite event hosted by Oskar Blues Brewing in Longmont Colorado. This event continues to afford the opportunity to introduce faculty, the curriculum model and faculty performance expectations with all incoming students.

4. Curriculum Map

SLO / Course	7106 Business	7116 Materials	7126 Science 1	7136 Science 2	7146 Facilities	7916 Practicum
Develop standardized recipes using primary and adjunct brewing ingredients		I	R	E		E
Identify major beer styles and their characteristic ingredients		I	R	E		E
Demonstrate knowledge of major factors used to assess ingredient quality, including alpha acid content, lovibond rating, and fermentable sugar content		I	R	E		E
Recognize and understand properties of brewing materials & processes that affect flavor, aroma, mouthfeel, body, appearance, and alcohol content		I	R	E		E
Implement the proper procedures to produce wort (unfermented beer)			I	R		E
Understand and explain the process of fermentation		I	E	E		R
Display familiarity with the steps required to take beer from the end of fermentation through the packaging of the product			I	R, E		E
Utilize analytical methods to determine beer quality and beer flaws		I	R	E		R
Create a robust vision, mission, and goals appropriate for the launch of a commercial craft brewery or expansion of an existing brewery	I, R, E					
Perform an accurate analysis of the craft brewing industry's competitive environment.	I,R, E					
Conduct a comprehensive cost analysis associated with starting a new craft brewery					I,R,E	
Identify the key equipment used in a commercial craft brewery, and how that equipment functions, how it is maintained and how that same equipment is cleaned and sanitized					I,R,E	

Key-
I = Introduction
R = Reinforcement
E = Emphasis

Measurement

5. Outcome-Measure Alignment

Specific assessment measures come in a variety of forms, including the use of grading rubrics, surveys of alumni and industry professionals, multiple choice questions from exams, short-answer/essay questions (also from exams), multiple choice and fill in the blank quizzes and semester long projects which culminate in an in-depth paper/report.

As with all programs and related courses, individual faculty are allowed to determine which form of measurement best suits their class, and the SLO'S they are measuring. The grading rubrics utilized were developed by faculty as a way to measure several of the SLO'S.

Additionally, an annual survey is sent to graduates from the program, which includes a variety of questions focused mainly on their employment status, and how well the program prepared them for both their entry into the workforce and their ongoing development. A survey is also administered to industry professionals, who supervise the students during their practicum experience. This survey focuses on the performance of the students across a number of dimensions, including how well prepared they were to enter the workforce, their ability to communicate and complete assigned tasks in a satisfactory manner. Further detail will be provided in the results section of this report in regards to the actual measurement of PLO'S and SLO'S, and how they were measured.

6. Direct Measures

As indicated, most, if not all assessment methods employed by the faculty are of a direct nature. Further and more comprehensive detail on the methods employed will be provided under the results section of the report.

7. Data Collection

Data is collected in a number of ways:

- **Alumni Survey (Appendix 1)** - Every year a survey is sent out to students who graduated during the previous Academic Year. A variety of questions are asked, with a focus on their ability to gain employment either prior to, or immediately after graduation, their current employment status (to see who has been promoted, changed jobs since their graduation) and how well the program has prepared them for their chosen field. A 1-5 scale is used for all scaled questions and there are also several open ended questions asking for ideas about ways to improve the program, if the curriculum was relevant to their careers and how the program can continue to serve them now that they are graduates.
- **Practicum Supervisor Reports (Appendix 2)** - Annually practicum supervisors are asked to report on student performance at the end of the practicum exercise. Practicum supervisors are provided with a short rubric designed to evaluate the students across a number of variables including: attitude and appearance, communicative ability, job performance and overall performance. Supervisors are asked to evaluate students on a Likert scale ranging from (1) Poor to (5) Excellent.
- **Grading Rubrics** -As noted earlier program faculty have developed a number of grading rubrics that speak to the various course learning outcomes and their relation to the overall student

learning outcomes set for the program. Examples of these rubrics will be provided as appendices to this report.

- **Tests/Essay's & Reports** - Each faculty member employs a variety of assessment techniques to assess the various course outcomes addressed by their class, and their relation to the overall Student Learning Outcomes. The specific assessment techniques utilized for each course are determined by the individual faculty member assigned to that specific course. The faculty feel that the faculty member of record is best placed to determine which techniques are best placed to evaluate a student's performance of a specific skill or task. More specific details about the techniques employed, their associated rating/scoring and student performance on these questions will be included in the results section of this report.

Results

8. Reporting Results

Program Learning Outcome Results

The program has one overarching Program Outcome, namely: ***Graduates of the program will be satisfied that they are prepared for career entry in the commercial brewing sector.***

Two assessment methods are utilized annually in order to assess the program's effectiveness at preparing graduates for entry to the commercial brewing sector: the alumni survey **(Appendix 1)** which testifies to alumni perception and the Practicum Supervisor Report **(Appendix 2)** which testifies to the industry perception of their performance.

PLO Assessment Method 1: Alumni Survey (Appendix 1)

Assessment Method Description

Annually, alumni of the Brewing program are evaluated across a range of issues pertaining to career preparation. Students are evaluated on their competency to work in commercial brewing industry settings. More specifically, graduates are asked to evaluate the relevance and importance of their curriculum to workplace performance.

To date three surveys have been administered to graduates over the 2014/15, 2015/16, and 2016/17 academic years. A total of 13 surveys (6 responses received) were administered to alumni of the 2016/2017. Unfortunately only 6 surveys were returned.

Students were asked to self-report on range of overall satisfaction variables on a 5-point Likert scale anchored at "1= Very Satisfied" to "5= Not Very Satisfied"

Findings

Students were evaluated on the overall quality of their experience while completing the online Brewing Science Program and their preparedness for the world for work. Specifically, five questions were asked that spoke to:

1. Overall satisfaction with curriculum - breadth and depth - m=1.83/5
2. Overall quality of the brewing program at Auburn - m=1.33/5
3. Overall preparation to work in the commercial brewing sector - m=1.33/5
4. Quality supervision and overall preparation for practicum - m=1.67/5
5. Overall quality of graduate level teaching by faculty- m=1.67/5

Average student evaluations for the 2016/17 class ranged from an excellent m=1.33/5 for "Overall quality of the Brewing Program at Auburn" to graduate level teaching by faculty" to a strong m=1.83/5 for "Overall Satisfaction with the Curriculum Breadth and Depth". Overall Quality of Graduate Teaching by Faculty also recorded an excellent 1.67/5. All overall satisfaction variable scores ranged from Very good to Excellent.

These are much improved results on the two previous academic years. This is reflective of the changes made by faculty based upon the feedback in previous years. For example feedback received from the 2015/16 survey pointed to a m=4/5 for "Overall preparation to work in the commercial brewing sector". 2016/17 was much improved at an excellent 1.33/5. Similarly, 2015/16 results pointed to an average m=3/5 for "Quality supervision and overall preparation for practicum". The 2016/17 score was recorded at a much improved m=1.67/5. In all cases the faculty reflected on the feedback offered during the 2015/16 survey and made appropriate changes throughout the curriculum. Most gratifying was the fact that student feedback pointed to an excellent m=1/5 program recommendation to others.

How did you use findings for improvement?

These results were shared with the faculty in addition to their normal AU teaching evaluation scores. While these overall results are extremely positive, the survey did point to a number of less than satisfactory issues with the current delivery vehicle for online programing at the university (CANVAS) and lack of career advise. Student satisfaction with the CANVAS system was recorded at a m=2.17/5 which is well below the norm for other satisfaction variables. Similarly students reported a m=2.5/5 for the technical assistance they received in dealing with the variety of online delivery problems experienced. Students also reported a m=2.17/5 forthe Career Advisement received over the course ofthe program. While these scores are not entirely displeasing they do serve as outliers when overall performance is considered and have focused both faculty and the Program Director's attention on improvement. Upon further investigation most of the issues that students had pertaining to CANVAS were access oriented when the system was down for improvement. At this point there is no real way to predict when the system will be down or when outages may occur. Campus IT has assured us that when planned outage dates are set, they will share this information, such that it can then be passed on to all students. The Program Director has now started to post career related opportunities to the program's Facebook support page, in addition to sharing with each cohort as these opportunities come in. Additionally, he has instituted the practice of calling student for a career development conversation during each semester and in particular during their practicum semester, which typically falls in the summer of each academic year.

PLO Assessment Method 2: Practicum Supervisor Reports (Appendix 2)

Assessment Method Description

Immediate supervisors at required Practicum sites were invited to evaluate student work competencies based upon their experience with students in the HOSP7916 Brewing Practicum course. Supervisors will be asked to report on student competencies across a 5-point Likert scale anchored at "1=poor" to "5=excellent."

Findings

All students were found to have performed in excellent fashion by all work based supervisors who reported. As with previous years it did prove somewhat problematic getting certain of the work based supervisors to submit their reports in a timely and legible fashion. In most cases this was handled by the students upon prompting by the Program Director. Based upon last year's concern over the lack of specific detail on student performance, the Program Director made a conscientious effort to reach out to all practicum supervisors to ensure a more detailed response. Unfortunately this did not prove fruitful as reports continue to lack detail.

How did you use findings for improvement?

While surveys have yet to point to an issue with student practice and while the current assessment method seems to suit industry supervisors and students well, the faculty continue to believe a greater emphasis needs to be placed on getting all supervisors to report in a more detailed fashion. One suggestion that has come forward is the idea of an exit interview with practicum supervisors, where more detail oriented questions could be asked and hopefully better feedback received. The goal being to have them point to deficiencies, if any, with the students' preparation or practicum. The Program Director is actively considering this approach for the 2017/18 practicum class.

Student Learning Outcome Results

As indicated there are a total of twelve student learning outcomes; namely upon successful completion of the program students will be able to:

1. Develop standardized recipes using primary and adjunct brewing ingredients.
2. Identify major beer styles and their characteristic ingredients.
3. Demonstrate knowledge of major factors used to assess ingredient quality, including alpha acid content, lovibond rating, and fermentable sugar content.
4. Recognize and understand properties of brewing materials & processes that affect flavor, aroma, mouthfeel, body, appearance, and alcohol content.
5. Implement the proper procedures to produce wort (unfermented beer).
6. Understand and explain the process of fermentation.
7. Display familiarity with the steps required to take beer from the end of fermentation through the packaging of the product.
8. Utilize analytical methods to determine beer quality and beer flaws.
9. Create a robust vision, mission, and goals appropriate for the launch of a commercial craft brewery or expansion of an existing brewery.
10. Perform an accurate analysis of the craft brewing industry's competitive environment.
11. Conduct a comprehensive cost analysis associated with starting a new craft brewery.
12. Identify the key equipment used in a commercial craft brewery, and how that equipment functions, how it is maintained and how that same equipment is cleaned and sanitized.

Student Learning Outcome 1

Students will be able to develop standardized recipes using primary and adjunct brewing ingredients

SLOI Assessment Method: HOSP7116 Recipe Formulation

Assessment Method Description

SLO 1- HOSP 7116 is developed so that Modules 1-5 expose students to the different brewing ingredients and how they impact flavor, color, mouthfeel, and alcohol. In addition, they practice evaluating these ingredients and performing basic calculations. In Module 6, the students bring the knowledge together to develop their own recipe using the skills that were learned and practiced in Modules 1-5. The Recipe Development Project is graded based on the students skills in bringing ingredients together with the proper calculations to make a palatable beer. Thus, the grade for this assignment reflects the student's ability to practice what they learned. The full grading rubric provided as Appendix 3.

Students are provided with a template to highlight the important components of the assignment with a grading rubric that places a range of point values for each aspect of the SLO. Once the grades are determine, they are assessed based on the following scale:

Assessment Rating Scale:

85 to 100% = Excellent, 70 to 84% = Average, <70% = Poor

Findings

Results from the 2017/18 cohort are:

SLOs	Excellent	Average	Poor
Recipe development assignment (graded based on rubric)	Overall the brewer has developed a good brewing plan that is developed from the perspective of a professional brewer (not homebrewer). The overall plan has a high chance of success at achieving the desired product in a manner that has some economic feasibility (i.e., not extremely rare ingredients or long procedures that cannot be justified).	Overall the brewer has developed a relatively good brewing plan that is developed from the perspective of a professional brewer, although it may have some elements carried over from homebrewing. The overall plan has a good chance of success at achieving the desired product, but may not be very feasible at the professional level.	Overall the brewer has developed a brewing plan that not well thought-out or it is more appropriate for homebrewing. The overall plan has a may not have good chance of success at achieving the desired product on a professional scale.
Students	20	1	0
Overall average	93%		

Overall SLO rating	Excellent

How did you use findings for improvement?

Except for one student, students were very excited about and motivated to complete this project. Of the 21 students enrolled in the class, 15 exceeded expectation with a grade of 95% or better. The one student with average (nearly poor performance) is the student with the least experience with brewing. This student had never brewed before and this assignment was probably a little too much for them this early in the program. How to evaluate novice brewers in a class dominated by experienced brewers will be discussed prior to the next course offering.

Student Learning Outcome 2

Students will be able to identify major beer styles and their characteristic ingredients

SL02 Assessment Method: Term Quiz

Assessment Method Description

Within Modules 9 to 13 of HOSP 7116, students are introduced to major beer styles defined by the Beer Judge Certification Program and the Brewer's Association. Students learn about these styles. Two quizzes were developed and administered student to assess their knowledge of beer styles and ingredients that are used to make them. Each quiz consisted of 10-15 multiple choice, true/false, and essay questions {example questions listed in appendix). For quizzes, following assessment rating scale was used to evaluate mastery of SLO 2:

Assessment Rating Scale:

85 to 100% = Excellent, 70 to 84% = Average, 55 to 69% = Poor, <55% = Little to None

Findings

Results from the 2017-2018 cohort are:

SLOs	Excellent	Average	Poor	Little to None
Quiz 9,10	' The brewer was able to correctly identify differences among a wide variety of beer styles. Brewer could identify ingredients that were characteristic of a particular style. In addition, brewer could describe a beer or differences in beer styles.	The brewer was able to correctly identify differences in beer style for the majority of the styles. However, some details among the styles are not clearly understood. Knowledge of ingredients that are characteristic of specific styles are good, but are lacking for a few styles. In addition, brewer could describe a beer ordifferences in beer styles for most styles.	For the most part, the brewer has a good understanding of most beer styles. However, some details among the styles are not clearly understood. Knowledge of ingredients that are characteristic of specific styles are good, but not comprehensive. In addition, brewer could describe a beer or differences in beer styles, but some styles may be better understood than others.	Brewer does nothave a clear understanding of the different styles of beer and the ingredients that define them. Brewer can articulate the differences between few to no styles.
Students Quiz Part 1	12	8	1	0
Students Quiz Part 2	14	6	0	1
Overall Part 1	86%			
Overall Part 2	83%			
Overall SLO average	85%			
Overall SLO ' rating	Excellent			

How did you use findings for improvement?

Overall, students did very well. A few students struggled with this assignment. For the next offering, I will develop a short practice assignment to help them differentiate the styles. There are considerable overlap in style categories, and it is sometimes overwhelming to learn all of the details all at once.

Student Learning Outcome 3

Student will be able to demonstrate knowledge of major factors used to assess ingredient quality, including alpha acid content, lovibond rating, and fermentable sugar content

SL03 Assessment Method: Quiz

Assessment Method Description

Modules 1-5 of the HOSP 7116 are designed to expose students to the ingredients used in brewing. As part of these modules, students are exposed to the many evaluation criteria for each ingredient (e.g., alpha acid and international bittering unit for hops). This SLO was assessed through the development of two quizzes that directly measure the SLO. One quiz is for grain and adjuncts and the other is for hops. Each quiz contained 9-10 questions as multiple choice, true/false, short answer, and essay (see appendix for example questions). For quizzes, following assessment rating scale was used to evaluate mastery of SLO 2:

Assessment Rating Scale:

85 to 100% = Excellent, 70 to 84% = Average, 55 to 69% = Poor, <55% = Little to None

Findings

Results from the 2017-2018 cohort are:

SLOs	Excellent	Average	Poor	Little to None
Quiz 9,10	The brewer was able to correctly identify indicators of ingredient quality and relate how they can be used to evaluate ingredients.	The brewer was able to identify most of the indicators of ingredient quality. For most of the indicators the brewer was able to identify how to use them for evaluation.	The brewer was not able to identify most of the indicators of ingredient quality. Using the indicators as tools to evaluate quality of grain or hops was not clearly evident or concepts were mixed up.	Brewer has little to no idea of the meaning behind many of the ingredient quality indicators. Brewer cannot relate how to use the indicator to evaluate quality ingredients.
Students Quiz {grain)	19	2	0	0
Students Quiz {hops)	20	1	0	0

Overall (grain)	94%
Overall {hops)	95%
Overall SLO average	95%
Overall SLO rating	Excellent

How did you use findings for improvement?

Overall, students did very well. This is not surprising has these terms are critical to brewing. The least experienced brewers are the ones that struggled the most. As discussed with SLOl, this will be discussed among the faculty on how to handle novice brewers. However, the standards of the program need to be met. It is normal to expect some to struggle more than others. These are critical concepts for all brewers.

Student Learning Outcome 4

Students will be able to recognize and understand properties of brewing materials & processes that affect flavor, aroma, mouth/eel, body, appearance, and alcohol content.

SL04 Assessment Method: Semester Assignment

Assessment Method Description

In HOSP 7116, brewing materials and processes are discussed in Modules 1-5, where aspects of the effects of ingredient and process are mentioned. However, in Module 7 and 8, the focus is specifically on flavor, aroma, mouthfeel, body, appearance and alcohol content and the factors that affect it. Learning activities that support this SLO are then brought together into an assignment that evaluate beer quality and flavor. The major focus of this assignment is for students to use their knowledge of materials and their role on quality to develop and conduct a statistically valid test to assess beer quality. The grade for this assignment is based on a rubric (see appendix) and used as part of the SLO assessment. In addition, students are required to evaluate beer quality {6 beer styles over 3 weeks) and consider the processes that may have caused the attributes of the final beer. In total, there is one project assignment and 6 quality assessments that are used to determine the student's ability to recognize and understand the properties of brewing materials and processes that affect beer attributes.

Assessment Rating Scale:

85 to 100% = Excellent, 70 to 84% = Average, 55 to 69% = Poor, <55% = Little to None

Findings

Results for the 2017/18 class

SLOs	Excellent	Average	Poor	Little to None
Sensory evaluation project (graded based on rubric)	Overall, the brewer can identify materials or processes that affect flavor and design a statistically valid test to determine subtle differences in beer that could affect consumption and/or marketability of beer	The brewer either can identify materials or processes that affect flavor or design a statistically valid test. However, the brewer had trouble with at least one of the two aspects.	Brewer struggled with identifying a material or process that affect beer flavor and could not develop a statistically valid test to assess beer.	Brewer could not identify a material or process that affected beer flavor and could not develop a statistically valid test to assess beer or did not attempt assignment.
Sensory evaluation	19	0	0	2
Beer evaluation				
Lagers/Hybrids	19	2	0	0
British Ales	18	3	0	0
American/British Ales	19	2	0	0
European Ales	19	2	0	0
Misc beer styles	19	2	0	0
Mead/Cider	21	0	0	0
Sensory evaluation	89%			
Beer evaluation: Lagers/Hybrids	89%			
British Ales	98%			

American/British Ales	96%
European Ales	98%
Misc beer styles	98%
. Mead/Cider	98%
Overall average	. 96%
Overall SLO rating	Excellent

How did you use findings for improvement?

Overall, students did very well. This is not surprising as beer evaluation is often what attracts students to the field. Two students did get behind in the class and decided not to do the sensory evaluation assignment. I do not feel this reflects in their abilities, but in their lack of time. If the two who did not complete the assignment are omitted from the average, the average was 99%. Feedback on all of these assignments were very good. Students really enjoyed these assignments and felt they learned a lot, even though it took time and, in the case of the sensory evaluation project, required them to do statistics.

Student Learning Outcome 5

Students will be able to implement the proper procedures to produce wort (unfermented beer)

SLOS Assessment Method: Various

Assessment Method Description

Students were assessed on the their ability to demonstrate competency in formula development, wort production, fermentation, brew processing, modern and classical maturation strategies and analytical methods to determine quality and quality control procedures using 3 assessment methods.

1. Weekly short multiple guess quizzes to reinforce the principle concepts covered in the current week of material presented.
2. Weekly Discussions (discussions are conducted asynchronously online among faculty and students and student contributions are assessed for relevance and competence.
3. Midterm exams (2) equally placed at intervals of approximately 1/3 and 2/3 through the semester that were composed of short essay-style questions/answers comprehensively covering the preceding 1/3 of the course.

A standardized assessment rubric was used to evaluate actual performance on both SLO 5 and SLO 6 (Appendix 5).

- Outstanding- Project is creative and demonstrates an in-depth understanding and analysis of the brewing process.
- Good - Project demonstrates understanding and analysis of the brewing process but lacks either creativity or an in-depth understanding.
- Fair - Project demonstrates some understanding and analysis of the brewing process and no creativity.
- Poor - Project demonstrates little understanding and analysis of the brewing process.

Overall, results showed that 17 (85%} students scored A/Outstanding, 2 (10%} students scored B/Good and 1 (5%} student was graded C/Fair at the end of the semester.

Assessment Method 1: Weekly short multiple guess quizzes to reinforce the principle concepts covered in the current week of material presented.

Findings

These assessments were not graded but were provided to students as an instantly assessed online multiple guess form of feedback to allow self-assessment of understanding at the end of each week's video lectures. All students answered these questions perfectly (100% correct after 1 or 2 attempts}.

How did you use findings for improvement?

The overall excellent results of this instant assessment provided confidence to the students in their online learning and comprehension. The questions and the format were altered this year to improve the delivery and content and this new format will be continued.

Assessment Method 2: Weekly Discussions (discussions are conducted asynchronously online among faculty and students and student contributions are assessed for relevance and competence.

Findings

These assessments were graded S/U over the course of the entire semester to ensure students were engaged and participating in the technical asynchronous discussions online. No attempt to assess the quality of the discussions was attempted but a regular participation was expected including contributions to the technical discussions. An assessment for the entire semester effort was calculated based on frequency of participation and technical contributions to the discussions. Results showed that 15 {75%} students scored Outstanding, 4 {20%} students scored Good and 1 {5%} student was graded Poor and failed this assessment due to lack of participation.

How did you use findings for improvement?

The overall excellent results of this assessment provided a measure of student involvement each week allowing faculty to monitor progressive improvements in online learning and comprehension. The faculty started each week's discussion by posing a new question each week to ensure the discussion and the format were guided in the direction of the week's lecture topic. This more directed discussion was very successful and will be continued.

Assessment Method 3: Midterm exams {2} equally placed at intervals of approximately 1/3 and 2/3 through the semester that were composed of short essay-style questions/answers comprehensively covering the preceding 1/3 of the course.

Findings

These assessments were graded short essay style exam questions answered in a limited time. Results for midterm 1 showed that 17 {85%} students scored Outstanding and 3 {15%} students scored Good demonstrating an above average level of comprehension at this early stage in the semester. Results for midterm 2 showed that 12 {60%} students scored Outstanding, 6 {30%} students scored Good and 2 (10%} students scored Fair still providing confidence in a very high to above average level of comprehension at 2/3 of the way through the semester of the semester.

How did you use findings for improvement?

The overall excellent results of this more comprehensive and in depth assessment provided confidence that the students were mastering this complex discipline well even as the volume of material grew and the complexity of the problems expanded. The questions and the format were unchanged and continue to provide an accurate measure of student learning. We have started to coach students who do see a drop in their midterm 2 grade to help them improve performance in the final exam.

Student Learning Outcome 6

Students will be able to understand and explain the process of fermentation

SLOG Assessment Method: Various

Assessment Method Description

Students were again assessed on the their ability to demonstrate competency in fermentation, brew processing, modern and classical maturation strategies and analytical methods to determine quality and quality control procedures using 2 principal assessment methods. In each case the method was designed to assess both understanding of materials presented each week and to assess the importance of these materials in the entire discipline of brewing science as described in SLO 6.

1. Essays/projects in which each student develops first, a technical description of the complexities encountered in the use of high-alpha acid hop varieties as adjuncts in wort, and second, each student designs and develops a European Ale recipe starting with selection of materials and following through to the completion of fermentation including details concerning each component and step in the production of finished beer.
2. Final comprehensive short essay-style exam is administered at the end of the course to fully assess learning of the course materials.

As with SLO 5, a standardized assessment rubric was used to evaluate actual student performance on fermentation (Appendix 5).

- Outstanding - Project is creative and demonstrates an in-depth understanding and analysis of the brewing process.
- Good - Project demonstrates understanding and analysis of the brewing process but lacks either creativity or an in-depth understanding.
- Fair- Project demonstrates some understanding and analysis of the brewing process and no creativity.
- Poor - Project demonstrates little understanding and analysis of the brewing process.

As with SLO 5, overall, results showed that 17 (85%) students scored A/Outstanding, 2 (10%) students scored B/Good and 1 (5%) student was graded C/Fair at the end of the semester.

Assessment Method 1: Students were required to design, plan and successfully execute a brewing project. Two essays/projects are required in which each student develops first, a technical description of the complexities encountered in the use of high-alpha acid hop varieties as adjuncts in wort, and second, each student designs and develops a European Ale recipe starting with selection of materials and following through to the completion of fermentation including details concerning each component and step in the production of finished beer.

Findings

In Project 1, results show that 17 (85%) students were scored as Outstanding, 2 (29%) students were scored as Good, and 1 (5%) student was graded as Poor and failed this project grade due to a failure to submit the project. Students were presented with a complex problem in hop usage which they were asked

to analyze and offer alternative solutions for including a detailed analysis of the outcomes for the finished product. In Project 2, 19 (95%} students were scored as Outstanding and 1 (5%} student was scored Good. This change demonstrated a clear improvement in both performance and in obtaining complete submissions. The students were required to develop a recipe for brewing a classic modern beer style with comprehensive assessment of each component and technical method used and including complete calculations for each component addition and type as well as the commercial source for each component.

How did you use findings for improvement?

The overall excellent results in HRMT7126 led us to modify the project moving away from a previous collaboration with another course to set up an independent project designed to more closely follow the lecture materials in HRMT7126. The students rose to the challenge as shown by the excellent results in these essays and in the level of creativity demonstrated. This style of project was well received and will be continued.

Assessment Method 2: Final comprehensive short essay-style exam is administered at the end of the course to fully assess learning of the course materials.

Findings

This assessment was a graded comprehensive short essay style exam that allowed written support but not discussion and was time limited. It was intended to simulate a real world problem solving experience. All students answered these questions well. The results show that 16 (80%} students were scored as Outstanding and 4 (20%} students were scored as Good demonstrating that all students enrolled mastered the materials presented at a high level of competence.

How did you use findings for improvement?

The overall excellent results of this assessment provided confidence in the learning model presented to the students and their online learning comprehension. This format will be continued.

Student Learning Outcome 7

Students will be able display familiarity with the steps required to take beer from the end of fermentation through the packaging of the product

SL07 Assessment Method: Various

Assessment Method Description

Students were assessed on their ability to demonstrate competency in moving fermented beer through the packaging cycle using a variety of assessment methods. In each case the method was designed to assess both understanding of materials presented each week and to assess the importance of these materials in the entire discipline of brewing science.

1. Weekly short multiple guess quizzes to reinforce the principle concepts covered in the current week of material presented.
2. Weekly Discussions {discussions are conducted asynchronously online among faculty and students and student contributions are assessed for relevance and competence.
3. Midterm exam, at approximately the halfway point of the semester, composed of short essay-style questions/answers comprehensively covering the first half of the course.
4. Final comprehensive short essay-style exam is administered at the end of the course to fully assess learning of the course materials.

A standardized assessment rubric was used to evaluate actual performance {Appendix 6).

- Outstanding- Project is creative and demonstrates an in-depth understanding and analysis of the brewing process.
- Good - Project demonstrates understanding and analysis of the brewing process but lacks either creativity or an in-depth understanding.
- Fair - Project demonstrates some understanding and analysis of the brewing process and no creativity.
- Poor - Project demonstrates little understanding and analysis of the brewing process.

Assessment Method 1: Weekly short multiple guess quizzes to reinforce the principle concepts covered in the current week of material presented.

Findings

These assessments were not graded but were provided to students as an instantly assessed online multiple guess form of feedback to allow self-assessment of understanding at the end of each week's video lectures. All students answered these questions perfectly {100% correct after 1 or 2 attempts).

How did you use findings for improvement?

The overall excellent results of this instant assessment provided confidence to the students in their online learning and comprehension. The questions and the format were altered next year to improve the delivery and content and this new format will be continued.

Assessment Method 2: Weekly Discussions {discussions are conducted asynchronously online among faculty and students and student contributions are assessed for relevance and competence.

Findings

These assessments were graded S/U over the course of the entire semester to ensure students were engaged and participating in the technical asynchronous discussions online. No attempt to assess the quality of the discussions was attempted but a regular participation was expected including contributions to the technical discussions. An assessment for the entire semester effort was calculated based on frequency of participation and technical contributions to the discussions. Results showed that 5 {29%) students scored Outstanding, 12 (71%) students scored Good and no {0%) students were graded Poor and failed this assessment due to lack of participation.

How did you use findings for improvement?

The overall excellent results of this assessment provided a measure of student involvement each week allowing faculty to monitor progressive improvements in online learning and comprehension. The faculty started each week's discussion by posing a new question each week to ensure the discussion and the format were guided in the direction of the week's lecture topic. This more directed discussion was very successful and will be continued. In this second semester, discussion tailed off mid-semester. The faculty will look for mechanisms to involve the students in more discussion.

Assessment Method 3: A midterm exam is given at approximately 1/2 way through the semester that is composed of short essay-style questions/answers comprehensively covering the preceding 1/2 of the course.

Findings

These assessments were graded, short essay-style exam questions answered in a limited time. Results for the midterm showed that 16 (94%) students scored Outstanding and 1 {6%) student scored Good demonstrating an above average level of comprehension at this early stage in the semester.

How did you use findings for improvement?

The overall excellent results of this more comprehensive and in depth assessment provided confidence that the students were mastering this complex discipline well even as the volume of material grew and the complexity of the problems expanded. The questions and the format were unchanged and continue to provide an accurate measure of student learning.

Assessment Method 4: Final comprehensive short essay-style exam is administered at the end of the course to fully assess learning of the course materials.

Findings

This assessment was a graded comprehensive short essay style exam that allowed written support but not discussion and was time limited. It was intended to simulate a real world problem solving experience. All students answered these questions well.
Results show that 16 {94%) students were scored as Outstanding and 1 {6%) student were scored as Good demonstrating that all students enrolled mastered the materials presented at a high level of competence.

How did you use findings for improvement?

The overall excellent results of this assessment provided confidence in the learning model presented to the students and their online learning comprehension. This format will be continued.

Student Learning Outcome 8

Students will be able to utilize a series of analytical methods to determine beer quality and beer flaws

SL08 Assessment Method: Various

Assessment Method Description

Students were assessed on their ability to demonstrate competency in using a variety of methods to determine beer quality and manage beer flaws. In each case the method was designed to assess both understanding of materials presented each week and to assess the importance of these materials in the entire discipline of brewing science.

1. Weekly short multiple guess quizzes to reinforce the principle concepts covered in the current week of material presented.
2. Weekly Discussions (discussions are conducted asynchronously online among faculty and students and student contributions are assessed for relevance and competence.
3. Midterm exam, at approximately the halfway point of the semester, composed of short essay-style questions/answers comprehensively covering the first half of the course.
4. Final comprehensive short essay-style exam is administered at the end of the course to fully assess learning of the course materials.

A standardized assessment rubric was used to evaluate actual performance (Appendix 6}.

- Outstanding - Project is creative and demonstrates an in-depth understanding and analysis of the brewing process.
- Good - Project demonstrates understanding and analysis of the brewing process but lacks either creativity or an in-depth understanding.
- Fair - Project demonstrates some understanding and analysis of the brewing process and no creativity.
- Poor - Project demonstrates little understanding and analysis of the brewing process.

Assessment Method 1: Weekly short multiple guess quizzes to reinforce the principle concepts covered in the current week of material presented.

Findings

These assessments were not graded but were provided to students as an instantly assessed online multiple guess form of feedback to allow self-assessment of understanding at the end of each week's video lectures. All students answered these questions perfectly (100% correct after 1 or 2 attempts).

How did you use findings for improvement?

The overall excellent results of this instant assessment provided confidence to the students in their online learning and comprehension. The questions and the format were altered next year to improve the delivery and content and this new format will be continued.

Assessment Method 2: Weekly Discussions (discussions are conducted asynchronously online among faculty and students and student contributions are assessed for relevance and competence.

Findings

These assessments were graded S/U over the course of the entire semester to ensure students were engaged and participating in the technical asynchronous discussions online. No attempt to assess the quality of the discussions was attempted but a regular participation was expected including contributions to the technical discussions. An assessment for the entire semester effort was calculated based on frequency of participation and technical contributions to the discussions. Results showed that 5 (29%) students scored Outstanding, 12 (71%) students scored Good and no (0%) students were graded Poor and failed this assessment due to lack of participation.

How did you use findings for improvement?

The overall excellent results of this assessment provided a measure of student involvement each week allowing faculty to monitor progressive improvements in online learning and comprehension. The faculty started each week's discussion by posing a new question each week to ensure the discussion and the format were guided in the direction ofthe week's lecture topic. This more directed discussion was very successful and will be continued. In this second semester, discussion tailed off mid-semester. The faculty will look for mechanisms to involve the students in more discussion.

Assessment Method 3: A midterm exam is given at approximately 1/2 way through the semester that is composed of short essay-style questions/answers comprehensively covering the preceding 1/2 of the course.

Findings

These assessments were graded, short essay-style exam questions answered in a limited time. Results for the midterm showed that 16 (94%) students scored Outstanding and 1 (6%) student scored Good demonstrating an above average level of comprehension at this early stage in the semester.

How did you use findings for improvement?

The overall excellent results of this more comprehensive and in depth assessment provided confidence that the students were mastering this complex discipline well even as the volume of material grew and the complexity of the problems expanded. The questions and the format were unchanged and continue to provide an accurate measure of student learning.

Assessment Method 4: Final comprehensive short essay-style exam is administered at the end of the course to fully assess learning of the course materials.

Findings

This assessment was a graded comprehensive short essay style exam that allowed written support but not discussion and was time limited. It was intended to simulate a real world problem solving experience. All students answered these questions well. Results show that 16 (94%) students were scored as

Outstanding and 1 {6%) student were scored as Good demonstrating that all students enrolled mastered the materials presented at a high level of competence.

How did you use findings for improvement?

The overall excellent results of this assessment provided confidence in the learning model presented to the students and their online learning comprehension. This format will be continued.

Student Learning Outcome 9

Students will be able to create a robust vision, mission, and goals appropriate for the launch of a commercial craft brewery or expansion of an existing brewery

SL09 Assessment Method: Term Project

Assessment Method Description

Students develop a business plan for starting a brewery in HOSP7106 {The Business of Brewing). They are provided a suggested structure for organizing their plans. One of the key elements within this structure is a section on the brewery's objectives: vision, mission, and goals. A vision is a statement of what an organization aspires to become in the future. A mission articulates the purpose an organization fills in society. Goals are specific objectives that are created to guide an organization toward its vision while serving its mission. The professor for the course evaluates each student's vision, mission, and goals based on his/her professional training, experience, and expertise.

A standardized assessment rubric anchored at {1} Major Deficiencies through to {2} Moderate Deficiencies, (3) Minor Deficiencies and (4) Outstanding was used. This rubric was applied to the vision, mission, and goals provided within each student's plan. Due to changes in the ordering of courses, the last offering of HOSP7106 was fall 2016. Data from that class was used for assessment. The class will be taught again in summer 2018 and that data will be used in our next report.

Findings

Overall student performance was assessed as good. In particular: "Develop viable vision, mission, and goals for a brewery" - 8 out of 16 students did outstanding while 7 others had minor deficiencies. 1 student had moderate deficiencies.

	Major deficiencie	Moderate deficiencies	Minor deficiencies	Outstanding
Within a student's business plan, does he student provide a robust vision, mission, and goals appropriate for the launch of a commercial brewery or expansion of an existing brewery?	Vision, mission, and goals lack logic or are not provided	One or more elements judged to have modest problems; robustness is questionable **1 student**	One or more elements judged to have minor problems but vision, mission, and goals are viable **7 students**	All elements judged to be high quality **8 students**

How did you use findings for improvement?

The instructor met with staff at Auburn Online for feedback on his course construction. Auburn Online staff suggested that he tie more of his discussion board assignments directly to the skills needed within the business plan. Thus, the discussion boards are being revamped with more of a focus on the

business plan elements, such as vision, mission, and goals. This will allow students to work on mastering these elements prior to completing their business plans which should result in stronger performance within the business plans.

Student Learning Outcome 10

Students will be able to perform an accurate analysis of the craft brewing industry's competitive environment

SLO10 Assessment Method: Term Project

Assessment Method Description

Students develop a business plan for starting a brewery in HRMT 7106 (The Business of Brewing). They are provided a suggested structure for organizing their plans. One of the key elements within this structure is a section on analyzing the brewery's competitive environment. This allows students to ascertain the key opportunities and threats presented in the environment. The professor for the course evaluates each student's analysis on the competitive enviroment based on his/her professional training, experience, and expertise.

A standardized assessment rubric anchored at (1) Major Deficiencies through to (2) Moderate Deficiencies, (3) Minor Deficiencies and (4) Outstanding was used. This rubric was applied to the vision, mission, and goals provided within each student's plan. Due to changes in the ordering of courses, the last offering of HOSP7106 was fall 2016. Data from that class was used for assessment. The class will be taught again in summer 2018 and that data will be used in our next report.

	Major deficiencies	Moderate deficiencies	Minor deficiencies	Outstanding
Within a student's business plan, is the competitive environment analyzed well, including the unique opportunity that is being presented, market trends, existing competition, and target population for the brewery, including evidence of a large enough market to support the brewerv?	Intended market opportunity lacks logic or is not provided	One or more elements judged to have modest problems; viability of analysis is questionable **2 students**	One or more elements judged to have minor problems but analysis is viable **7 students**	All elements judged to be high quality **7 students**

Findings

Overall student performance was assessed as good. In particular: Accurately analyze the competitive environment for a brewery - 7 out of 16 students did outstanding while 7 others had minor deficiencies. 2 students had moderate deficiencies.

How did you use findings for improvement?

The current instructor met with staff at Auburn Online for feedback on his course construction. Auburn Online staff suggested that he tie more of his discussion board assignments directly to the skills needed within the business plan. Thus, the discussion boards are being revamped with more of a focus on the business plan elements, such as analysis of the craft brewing industry's competitive environment. This will allow students to work on mastering these elements prior to completing their business plans which should result in stronger performance within the business plans.

Student Learning Outcome 11

Students will be able to conduct a comprehensive cost analysis associated with starting a new craft brewery.

SLOll Assessment method (Direct) - Comprehensive written project.

Assessment Method Description

During the spring semester, 2018 a total of 17 graduate students were enrolled in HOSP 7146 Facilities Management for Brewers. As required by the faculty member of record, students were instrncted to complete a semester-long project which involved planning and developing a new craft brewery. Students were given a specific amount of startup funds to accomplish this goal and also had to factor in re-paying their loan at a fixed interest rate. This project represents a culminating experience for the students and requires them to both understand and apply the knowledge gained throughout the course to be successful. The student projects were evaluated across the following dimensions:

1. **Introduction-Please** provide a name for your new brewery, along with an outline of your anticipated output regarding both volume and product offerings. For example, are you going to start your brewery only producing an IPA, or will you also have other varieties for sale? Justification of your site location should also be included, both in a macro sense (Country, State, City) and in a micro sense (specific location within your city). Any other considerations or details sun-ounding the site selection can be included here.
2. **Location-Either** renting or purchasing is fine; however, you **must research an actual location that is available in the city of your choosing.** If you are going to purchase a location, please make sure that you include any taxes and fees associated with your real estate transaction. Please use a time frame of one year as your baseline in the estimation of all costs, which you can then break down into monthly expenses. Don't forget about a business license, liquor license and if you are going to be serving food (aka have brewpub) the required documentation and fees for this as well.
3. **Site Development-Depending** on your location, you will need to include the costs, as needed and dete1mined by you, of preparing your new site for the commercial production of beer. The scale and scope of renovations will be dependent on the site itself as well as the size and sophistication of your brewery. If you are going to have a Taproom or any other type of public/event space, please include these renovations in your estimate. While getting an actual quote from a contractor is most likely not feasible, estimated construction costs can be researched online and applied here.
4. **Equipment-You** can purchase or lease your equipment, and it can be new or used; again this is up to you. The type of equipment that you are going to purchase should also reflect the amount of staiiup funds that you have, the location selected and of course the beer(s) that you plan to produce. **This part of the project should be exhaustive.** Don't forget to include backup/spare parts for items as needed, cleaning and sterilization chemicals, PPE, hoses, pumps, bottling, and any other types of equipment that you will need. You may also opt to have a mobile bottling company come in and take care of your bottling needs. Please include these items in your report in an organized way (either an excel spreadsheet or an equipment and pricing table would be most helpful).
5. **Raw Materials-Price** the raw materials needed to produce your first run of beer that will be sold on the commercial market. We are assuming that you have already taken the time and energy to dial in your brewery and associated equipment. This should also include your estimated utility expenses (Water, Power, Gases, etc.). These prices will also be dependent on your location and how much your local municipality charges for them. Keep in mind that there is a maximum output production depending on your equipment. Only include the raw materials needed for actual Beer Production, but not cleaning and sterilization. You will need to reach out to the local municipality in your selected location to get prices and regulations regarding what can go down the drains.
6. **Waste Disposal-** Again, based on the size and sophistication of your brewery, you will need to price a waste contract with a provider that services your city and location.

7. **Summary-** Finally, construct your monthly budget considering all of the factors above. You will then be able to calculate how much production you will need to cover your costs for items 1-6. More production will also mean more expenses.

In order to emulate the quality of the project, the student projects were assessed by the faculty member of record utilizing a Critical Thinking Rubric based upon Bloom's Taxonomy (Appendix 6).This rubric was used to assess students across the six following variables: Knowledge (Know), Comprehension (Comp), Application (App), Analysis, Synthesis and Evaluation (Eval).

Findings

Each variable is graded as 1 (unacceptable) 2 (Marginal) 3 (Proficient) 4 (Advanced), with a perfect score equating to 24. The results for the class can be found in the table below

Comprehensive cost analysis project results

Student	Know	Comp	App	Analysis	Synthesis	Eval	Overall Score
1	4	3	4	3	4	3	21
2	3	4	3	4	4	4	21
3	4	4	4	4	4	3	23
4	4	4	4	4	3	3	22
5	3	3	4	4	4	4	22
6	4	4	3	3	4	4	22
7	4	4	3	3	4	4	22
8	4	4	3	3	3	4	21
9	3	3	3	4	4	4	21
10	4	3	3	4	4	4	22
11	4	4	4	4	3	3	22
12	3	4	4	4	4	4	23
13	4	4	4	3	3	3	21
14	3	4	3	4	4	4	22
15	4	4	3	4	4	4	23
16	4	4	4	3	3	3	21
17	4	4	4	4	4	4	24

Overall faculty are pleased with the performance of the students in this class on their written projects. Total scores ranged from a 21/24 or 87.5% to one perfect score. Looking more closely at the scores the two categories with the lowest overall average were "Application" and "Analysis." While these two categories are not low enough to be troubling, it has been noted by the instructor of record as areas that might need more attention. Specifically, this year's group of students mostly lacked in essential business experience, and this came through in their projects when they had to apply some basic business concepts to the planning process and also be able to analysis bids and other financial data related to their start-up brewery. This also may have become an issue in that the sequence of courses changed for this academic year. Previous coho1is have always had the Business of Brewing class before taking the Facilities class. Faculty will continue to monitor how students perform under the new cmriculum model and make adjustments as necessary.

How did you use findings for improvement?

Overall faculty are delighted with the results highlighted above for both SLO #11 and 12. The students are performing at a very high level. It should be noted that this cohmi of students represents the first group to go through the cun-iculum in a different order, with the business of brewing following the faculties class in the

sequence of classes. This may have hurt the student's ability to operate at the highest levels when it came to the written project and SLO#11. Faculty will continue to monitor student performance in this regard and look at possible ways to correct for this issue if it continues.

Another potential change would be the shifting of course content in the facilities management class to help even out the number of exam questions across the mid-term and final exam. Students may have felt pressured to write their responses more quickly when faced with eight questions on the final exam vs. five on the mid-term.

Student Learning Outcome 12

Students will be able to identify the key equipment used in a commercial craft brewery, and how that equipment functions, how it is maintained and how that same equipment is cleaned and sanitized.

SLO12 Assessment method (Direct) -Selected questions from the mid-term and final exam.

Assessment Method Description

All 17 students emolled in the HOSP 7146 Facilities Management for Brewers class are required to complete a timed mid-term and final exam. Both exams are administered electronically via Canvas. Each question response is given in the form of an essay, and most questions had multiple parts that required a thorough understanding of the course content and the ability to use that information to respond accordingly. Each response was graded by the instructor of record using the written communication rubric which can be found at the end of this report. This rubric was designed using Bloom's Taxonomy. The rubric contains four variables (Content, Organization and Development, Use of appropriate vocabulary/terminology of the brewing industry and use of grammar, sentence structure, and spelling). Each category is scored from 1-4; 1 being unacceptable, 2 being Marginal, 3 being Proficient and 4 being advanced, with a 16 representing a perfect score.

Findings

The mid-term exam consisted of five short answer questions with all five of those questions relating directly to SLO #12. The table below breaks down the performance of the students in relation to these five questions across the four aspects of the grading rubric.

Mid-Term Exam Results-3 questions

Student	Content	Organization and Development	Use of Vocab and Terminology	Use of Grammar, sentence structure and spelling	Total Score
1	4	4	4	4	16
2	4	4	4	3	15
3	4	4	4	4	16
4	4	4	4	4	16
5	4	4	3	3	14
6	4	4	4	4	16
7	4	4	4	4	16
8	3	3	4	4	14
9	3	3	3	4	13
10	4	4	4	4	16
11	4	3	4	4	15
12	4	4	3	4	15
13	4	4	3	4	15
14	4	4	4	4	16
15	3	4	4	4	15
16	4	4	4	4	16
17	4	4	4	4	16

The average score for all the students was a 14.3 or 14/16 or 88%.

The final exam consisted of 8 questions, with all eight directly relating to SLO #12. The same written communication rubric was again used to grade the shmi answer/essay responses given by the students. The table below highlights their performance across the four dimensions for all eight questions.

Final Exam Results

Student	Content	Organization and Development	Use of Vocab and Terminology	Use of Grammar, sentence structure and spelling	Total Score
1	3	3	3	3	12
2	4	4	4	4	16
3	4	4	4	4	16
4	3	3	3	4	13
5	3	3	3	4	13
6	3	3	2	4	12
7	4	4	4	4	16
8	4	4	4	4	16
9	4	2	4	4	14
10	4	4	4	4	16
11	3	3	3	4	13
12	4	4	4	4	16
13	3	3	4	4	14
14	4	4	4	4	16
15	4	4	4	4	16
16	4	3	3	3	13
17	4	4	4	4	16

The average score for the eight questions from the final exam was a 14.5 out of 16 or a 91%

Overall the students performed very well and showed a slight improvement from their mid-term exam to their final-exam (88% vs. 91%), which may be attributed to the students being more familiar with the testing procedures and how the information contained in the class will be used from an assessment perspective. The Development and Organization section has the lowest overall average for the four dimensions on the final exam and may speak to the time limit that was placed upon the students during the final exam. It should also be noted that the question on the final exam was more detailed and required the use of more specific terminology related to the brewing industry. Students may have been trying to process this detailed information and paid less attention to organizing their thoughts during the response. This may also be the underlying reason as to why the distribution of the final exam was more variable than the mid-term exam, even though the overall average for the mid-te1m exam was lower.

How did you use findings for improvement?

Overall faculty are delighted with the results highlighted above for both SLO #11 and 12. The students are performing at a very high level. It should be noted that this cohmi of students represents the first group to go through the cun-iculum in a different order, with the business of brewing following the faculties class in the sequence of classes. This may have hmi the student's ability to operate at the highest levels when it came to the written project and SLO#l l. Faculty will continue to monitor student perfmmance in this regard and look at possible ways to c01Tect for this issue if it continues.

Another potential change would be the shifting of course content in the facilities management class to help even out the number of exam questions across the mid-te1m and final exam. Students may have felt

pressured to write their responses more quickly when faced with eight questions on the final exam vs. five on the mid-term.

9. Interpreting Results

As demonstrated above in relation to all SLO's and related assessment methods, faculty have taken all feedback and results into consideration in continuously developing their course materials and delivery methods. A number of issues are worthy of special mention here:

- The move to the AU CANVAS system has been both smooth and problematic. Given the distance nature of the program, the student body is reliant totally upon access to CANVAS system for course materials and communication with each other and the faculty. When the system is down in either a scheduled or unscheduled sense, this presents great difficulty.
- The faculty are much happier with the expanded set of Student Learning Outcomes and the fact that they are truly reflective of the work that is actually done on program.
- Faculty continue to react well to the feedback offered by current students through their normal teaching evaluations, as well as from feedback offered by alumni through the alumni survey. This they continue to use to develop their courses on an ongoing basis and in many instances this has led this has happened in real time mid-semester, which to a very student focused team. This has resulted in the addition of many new video support and online smart board teaching materials that are now utilized by faculty to the benefit of all students. In truth, I could not be more delighted.
- The faculty continue to meet annually in the fall to share all assessment materials and discuss areas for improvement.

10. Communicating Results

As stated above, all results and assessment materials are shared annually with all faculty at our annual assessment meeting. This includes the Alumni Survey data, Practicum Supervisor Reports, Student Teaching Evaluation data for each course, actual performance data on each course as it relates to both the programs student learning outcomes, course learning outcomes and student performance. Faculty work closely with the Program Director to identify areas that students are underperforming in with a view to further developing course materials and delivery to improve performance. Faculty are very open about their student teaching evaluation feedback and where issues are identified work closely with the Program Director and each other to find ways to address problems. To this point, most issues have been minor and there has been nothing of a systemic nature other than with respect to the CANVAS delivery system.

Use of Results

11. Purposeful Reflection and Action Plan

As stated above, all results and assessment materials are shared annually with all faculty at our assessment retreat. This includes the Alumni Survey data, Practicum Supervisor Reports, Student Teaching Evaluation data for each course taught, actual performance data on each course as it relates to both the programs student learning outcomes and course learning outcomes. The goal here is to identify issues of concern to both students and faculty, to identify potential causes and then work to effect (with available resources in mind) change in a timely fashion. To date, this approach has served us well, but this is a new program with varying enrolment. This year's alumni survey results and practicum supervisor results should provide a good indication as to how we are performing.

APPENDIX 1

Brewing Science

This survey will inquire about your experiences as a graduate student with the Brewing Science Program of the Department of Nutrition, Dietetics, and Hospitality Management, here at Auburn University, and the impressions you may have of the program. We very much appreciate your feedback, and especially your honesty, in responding. In preparation for our regular review by the university, the Department of Nutrition, Dietetics, and Hospitality Management is interested in alumni perceptions of the program's effectiveness. We are committed to improving the quality of education here at Auburn University and your honest assessment of how well the Brewing Science Program has prepared you for a career in the commercial brewing sector. Your responses are completely anonymous and will beexamined and reported in aggregate form only. That Is, no personally identifiable Information will be collected, and your responses will never be individually examined.

Please rate how satisfied you are with these various aspects of your graduate brewing education in the Department of Nutrition, Dietetics, and Hospitality Management at Auburn University.

	Very Satisfied (1)	(2)	(3)	(4)	Very Dissatisfied (5)	N/A(6)
Faculty's general knowledge and currency in the field (1)						
Faculty's ability to inspire, motivate, and challenge students (2)						
Accessibility and helpfulness of the faculty, including provision of positive support to students (3)						
CANVAS online delivery system (5)						
Technical assistance with schoox online delivery system (6)						
Interpersonal support and helpful guidance (e.g., availability, encouragement, sense of being valued, encouragement of independence) (7)						
Academic modeling, including appropriate academic behavior, teaching ability, understanding of university procedures and ethical behavior (8)						
Collegiality of departmental student peer relations (9)						
Fairness and respect in faculty treatment of students (10)						
Welcoming climate for all different kinds of students (11)						

Opportunities to pursue collaborations and relationships, as well as interests and activities, outside of my academic department (12)

Program's ability to integrate recent developments in my field (13)

Quality of academic advising and guidance (14)

Helpfulness of faculty members in my department or program (15)

Assistance in finding practicum opportunities (16)

The multidisciplinary nature of my program (17)

Amount of coursework across disciplines (19)

Academic standards in my program (20)

Career advisement (21)

Curricular advising (22)

Professional competency of faculty (23)

Instructional competency of faculty (24)

Quality of courses, as preparation for employment (25)

The support of department staff (26)

The professionalism of department staff (27)

Q3 Overall, how would you rate the quality of:

	Excellent (1)	Very Good (2)	Good (3)	Fair (4)	Poor (5)
Overall satisfaction with curriculum-breadth and depth (1)					
Overall preparation to work in the commercial brewing sector (3)					
Quality supervision and overall preparation for practicum (4)					
Overall quality of graduate level teaching by faculty (5)					
Your academic experience at Auburn (6)					
Your online learning experience at Auburn (7)					
Your brewing program at Auburn (8)					
Your overall experience at Auburn (9)					

Q4 Indicate the extent of your agreement/ disagreement with the following statements concerning the course you took toward your graduate degree.

	Strongly Agree (1)	Agree (2)	Neither Agree nor Disagree (3)	Disagree (4)	Strongly Disagree (5)
The sequencing of courses was appropriate (i.e., courses taken later in the curriculum built on earlier courses and required a higher level of sophistication and intellectual challenge). (1)					
The course requirements for graduate students were meaningfully higher than for students enrolled for undergraduate credit. (2)					
Practical experiences (practicum, laboratory, internship, field experience, etc.) were of high quality. (3)					
I completed my degree requirements as planned. (4)	( )	( )	( )		
Academic/ professional interaction with other students contributed significantly to attaining my educational goals. (5)			(;		
Faculty provided clear understanding of the goals and requirements of each class. (6)					
Faculty provided clear understanding of evaluation methods used in each class. (7)					
The evaluation methods, and grades awarded, properly differentiated levels of student performance (i.e., grades awarded correctly distinguished the level at which students performed) (8)	( )				( )

Courses I took provided the necessary knowledge (major studies conducted and results of those studies) in my discipline. (9)

Courses I took provided an understanding of the major theories in my discipline. (10)

Courses I took provided an understanding of the accepted professional practices in my field. (11)

My instructors allowed students a reasonable degree of freedom-independence in the way assignment (e.g., papers or projects) were conducted. (12)

Q5 Please indicate your general satisfaction with the University and your program.

	Definitely (1)	Probably (2)	Maybe (3)	Probably Not (4)	Definitely Not (5)
If you were to start your graduate/professional career again, would you select this same university? (1)					
If you were to start your graduate/professional career again, would you select this same field of study? (2)		I)		( )	
Would you recommend this university to someone considering your program? (3)	1 1				
Would you recommend this university to someone in another field? (4)					

Q6 What would you change to make the student experience better?

_____

_____

_____

_____

_____

QS **What is your gender?**

1, i Male (1)

Female (2)

What is your age?

T 21-25 (67) ... 45+ (72)

09 Do you currently work in brewing sector?

:) Yes (1)

*(*l No (2)

10 Are you a full time or part time employee?

1 Full time (1)

Part-time (2)

Doing what and for whom?

_____

_____

_____

11 **What is your approximate annual income?** *Indicate salary before deductions without fringe benefits paid by the employer.*

1 .1 Less than $20,000 (1)

J $20,000 - $34,000 (2)

$35,000 - $49,999 (3)

( ) $50,000 - $64,999 (4)

1 $65,000 - $80,000 (5)

) More than $80,000 (6)

If you hold an academic position, what Is your present academic rank:

( ) I don't hold an academic position (1)

Professor (2)

Associate Professor (3)

) Assistant Professor (4)

Lecturer or Instructor (5)

If you hold an academic position, how would you describe your prospect for tenure?

I don't hold an academic position (1)

< > My institution doesn't offer tenure (2)

I have tenure now (3)

I Very Good (4)

Unsure (5)

Poor (6)

12 In your own words please tell us what excited you most and least about the program?

_____

_____

_____

_____

_____

Please feel free to add any comments that will help us strengthen our Graduate Certificate Program in Brewing Science at Auburn.

_____

_____

Thank you for your time and WAR EAGLE!

APPENDIX 2

HOSP7916
BREWING PRACTICUM
FINAL PERFORMANCE EVALUATION
Auburn University

BREWING SCIENCE PROGRAM

Prope1iy Phone _____

Address _____

City, State & Zip _____

Supervisor Title _____

Student _____

Period Evaluated _____ to _____

Position _____

Department Ttl. Hrs. Worked _____

Job Responsibilities _____

INSTRUCTIONS: Listed below are a number of traits, abilities, and characteristics important for success in business. Place an "X" in the response column that best describes the student's performance. After completing the supervisor's p01iion of this evaluation: 1) discuss the evaluation with the student, 2) instruct the student to complete and sign the student's po1iion, and
3) please remind the student to send the completed form to the address on the last page. Thank you for your assistance with our practicum program this year.

I. ATTITUDE AND APPEARANCE

	Excellent	Good	Average	Below Average	Poor
Self-confidence					
Initiative					
Enthusiasm/Interest					
Attendance/punctuality					
Deals with stress					
Accepts constructive criticism					
Leadership qualities					
Dress, personal appearance, grooming					

Comments:

II. COMMUNICATIONS

Intern's ability to relate to:	Excellent	Good	Average	Below Average	Poor
Supervisors					
Peers					
Guests					
Subordinates					
Writing ability					
Listening ability					
Speaking ability					

Comments:

III. JOB PERFORMANCE

	Excellent	Good	Average	Below Average	Poor
Knows job duties & operating procedures					
Maintains job standards					
Able to operate equipment					
Uses Initiative					
Carries out instructions					
Concern for costs/profit					
Quantity of work completed					
Quality of work completed					
Abilityto "catch on"					

Comments:

OVERALL PERFORMANCE

	Excellent	Good	Average	Below Average	Poor
Relative to standard employee performance expected					

Comments:

APPENDIX 3

Appendix 3

Recipe Development Rubric (SLO 1)

Criteria	Total Points	Excellent 80-100% of total points	Average 50-80% of points	Poor 0-50% of total points
Beer Description Paragraph & associated table of beer characteristics	**20**	Beer description either conforms to a specifically stated style or states how it will depart from conventional style guides. Style guides are correct and/or targets reflect stated departures from style.	A style is stated, but the description does not quite match the style and/or the justification for departures from the style is well justified. Brewing targets are good, but could be improved or refined.	The target style is not stated and/or the description does not match the style at all. There is poor justification for the qualities presented and/or the brewing targets are unreasonable for the described beer.
Malt Selection & Analysis	10	Grain/malt selections are appropriate for the style/description. The maltery is identified and the malt analysis is provided.	Grain/malt selections are appropriate for the style/ description. The maltery and/or malt analysis is provided but contains some errors.	Grain/malt selections are not appropriate for the style/ description. The maltery and/or malt analysis contains is blank or contains numerous errors.
Grain Bill	**10**	Calculations are correct using the grain/malt selected from the previous section.	Calculations are mostly correct using the grain/malt selected from the previous section, but there are some errors.	Calculations are incorrect using the grain/malt selected from the previous section.
Water Profile/ Adjustments	5	Water adjustment has been eva_luated. Changes and/or lack of change is justified.	Water adjustment has been evaluated. Changes and/or lack of change is justified, but either not thoroughly enough or incorrectly.	Water adjustment has not been evaluated or evaluated very poorly. Changes and/or lack of change is not justified.
Mash Schedule	5	Target temperatures are appropriate for grain/malt used. There is a clear well-thought-out protocol for the mash.	Target temperatures are generally appropriate for grain/malt used. Protocol is not clear or well thought-out.	Target temperatures are not appropriate for grain/malt used. Protocol is not clear or well thought-out.
Boil time & Misc additions	5	Additions of other ingredients are appropriate and timing is correctly described	Most of the additions of other ingredients are appropriate and timing is relatively correct. A few small mistakes may occur.	There are inappropriate additions or lack of appropriate additions and/or timing is inappropriate.
Hop Schedule	**15**	Hop selections are appropriate for the style. IBU contribution is correctly calculated. Justification for the use and timing of the hop is appropriate.	Hop selections are generally appropriate for the style. IBU contribution is correctly calculated although small errors may exist. Justification for the use and timing of the hop is appropriate or nearly so.	Hop selections are not appropriate for the style. IBU contribution is not correctly calculated. Justification for the use and timing of the hop is not appropriate.
Yeast Selection	**10**	Yeast is appropriate for the described style and flavors outlined in the beer description. Fermentation plan, e.g., temperature(s) and time(s), are appropriate. All ingredient additions during fermentation are well-described and appropriate.	Yeast is appropriate for the described style and flavors outlined in the beer description. Fermentation plan, e.g., temperature(s) and time(s), are appropriate, but there may be a few mistakes and/or plan is poorly described. All ingredient additions during fermentation are appropriate, but possibly not well described.	Yeast is not appropriate for the described style and flavors outlined in the beer description. Fermentation plan, e.g., temperature(s) and time(s), is not appropriate. All ingredient additions during fermentation are poorly described and/or inappropriate.
Finishing	10	Post-fermentation steps, e.g., cold crashing, filtering, carbonation, bottling, kegging, canning, etc., are clearly described and appropriate.	Post-fermentation steps, e.g., cold crashing, filtering, carbonation, bottling, kegging, canning, etc., are described and appropriate, but some details are missing or erroneous.	Post-fermentation steps, e.g., cold crashing, filtering, carbonation, bottling, kegging, canning, etc., are not clearly described and/or are not appropriate.
Overall	10	Overall the brewer has developed a good brewing plan that is developed from the perspective of a professional brewer (not	Overall the brewer has developed a relatively good brewing plan that is developed from the perspective of a professional	Overall the brewer has developed a brewing plan that not well thought-out or it is more appropriate for homebrewing.

		homebrewer). The overall plan has a high chance of success at achieving the desired product in a manner that has some economic feasibility (i.e., not extremely rare ingredients or long procedures that cannot be justified).	brewer, although it may have some elements carried over from homebrewing. The overall plan has a good chance of success at achieving the desired product, but may not be very feasible at the professional level.	The overall plan has a may not have good chance of success at achieving the desired product on a professional scale.
TOTAL	100			

APPENDIX 4

Appendix 4

Sensory Evaluation Panel Rubric

Criteria	Total Points	Excellent 80-100% of total points	Average 50-80% of points	Poor 0-50% of total points
Test Question	20	The test question is appropriate for the test.	The test question is marginally appropriate for the test.	The test question is not appropriate for the test.
Testing Procedure	30	The procedure is appropriate to test the desired question. The statistical parameters, such as sample size and errors, are appropriate.	The procedure is appropriate to test the desired question, but some of the errors or other statistical parameters are not correct. The number of assessors may or may not be completely accurate.	The procedure is not appropriate to test the desired question. The statistical parameters, such as sample size and errors, are not appropriate.
Sensory Panel Performance	20	A sensory panel was conducted and any problems were noted.	A sensory panel was likely conducted, but few details were included in the report.	A sensory panel was not conducted.
Results	30	The results were determined correctly and conclusions were valid based on the test performed. Problems, clarifications or considerations for future testing were discussed.	The results were determined mostly correctly and conclusions were generally valid based on the test performed. Problems, clarifications or considerations for future testing were 'discussed, but may have been incorrectly perceived.	Results were not determined correctly and conclusions were not valid.
TOTAL	100			

APPENDIX 5

Appendix 5

Assessment Rubric

Demonstrated comprehension of:	Poor	Fair	Good	Outstanding
Milling	Fails to demonstrate competence regarding the principles, elements & science involved	Demonstrates a superficial competence regarding the principles, elements & science involved	Demonstrates a general competence regarding the principles, elements & science involved	Demonstrates a thorough understanding of the principles, elements & science involved
Mashing	Fails to demonstrate competence regarding the principles, elements & science involved	Demonstrates a superficial competence regarding the principles, elements & science involved	Demonstrates a general competence regarding the principles, elements & science involved	Demonstrates a thorough understanding of the principles, elements & science involved
Sparging	Fails to demonstrate competence regarding the principles, elements & science involved	Demonstrates a superficial competence regarding the principles, elements & science involved	Demonstrates a general competence regarding the principles, elements & science involved	Demonstrates a thorough understanding of the principles, elements & science involved
Boiling	Fails to demonstrate competence regarding the principles, elements & science involved	Demonstrates a superficial competence regarding the principles, elements & science involved	Demonstrates a general competence regarding the principles, elements & science involved	Demonstrates a thorough understanding of the principles, elements & science involved
Fermentation	Fails to demonstrate competence regarding the principles, elements & science involved	Demonstrates a superficial competence regarding the principles, elements & science involved	Demonstrates a general competence regarding the principles, elements & science involved	Demonstrates a thorough understanding of the principles, elements & science involved
Packaging	Fails to demonstrate competence regarding the principles, elements & science involved	Demonstrates a superficial competence regarding the principles, elements & science involved	Demonstrates a general competence regarding the principles, elements & science involved	Demonstrates a thorough understanding of the principles, elements & science involved
Detection & Management of Flaws	Fails to demonstrate competence regarding the principles, elements & science involved	Demonstrates a superficial competence regarding the principles, elements & science involved	Demonstrates a general competence regarding the principles, elements & science involved	Demonstrates a thorough understanding of the principles, elements & science involved

APPENDIX 6

Appendix 6

Business Planning Assessment Rubric

	Poor	Fair	Good	Outstanding
Within a student's business plan, does the student provide a robust vision appropriate for the launch of a commercial brewery or expansion of an existing brewery?	Fails to demonstrate competence regarding vision. Vision lacks logic or is not provided	Demonstrates a superficial competence regarding vision. Vision judged to have moderate problems; robustness is questionable	Demonstrates a general competence regarding vision. Vision judged to have minor problems but vision is viable	Demonstrates a thorough competence regarding vision. Vision judged to be high quality
Within a student's business plan, does the student provide a robust mission appropriate for the launch of a commercial brewery or expansion of an existing brewery?	Fails to demonstrate competence regarding mission. Mission lacks logic or is not provided	Demonstrates a superficial competence regarding mission. Mission judged to have moderate problems; robustness is questionable	Demonstrates a general competence regarding mission. Mission judged to have minor problems but mission is viable	Demonstrates a thorough competence regarding mission. Mission judged to be high quality
Within a student's business plan, does the student provide robust goals appropriate for the launch of a commercial brewery or expansion of an existing brewery?	Fails to demonstrate competence regarding goals. Goals lacks logic or is not provided	Demonstrates a superficial competence regarding goals. Goals judged to have moderate problems; robustness is questionable	Demonstrates a general competence regarding goals. Goals judged to have minor problems but goals is viable	Demonstrates a thorough competence regarding goals. Goals judged to be high quality

APPENDIX 7

Appendix 7

Competitive Environment Assessment Rubric

	Poor	Fair	Good	Outstanding
Within a student's business plan, is the intended market opportunity that is being presented analyzed well?	Fails to demonstrate competence regarding intended market opportunity. Analysis of intended market opportunity lacks logic or is not provided	Demonstrates a superficial competence regarding intended market opportunity. nalysis of intended market opportunity judged o have modest problems; viability of analysis is questionable	Demonstrates a general competence regarding analysis of intended market goals. Analysis of intended market opportunity judged to have minor problems but analysis is viable	Demonstrates a thorough competence regarding analysis of intended market. Analysis of intended market opportunity judged to be high quality
Within a student's business plan, are market trends analyzed well?	Fails to demonstrate competence regarding market trends. Analysis of market trends lacks logic or is not provided	Demonstrates a superficial competence regarding market trends. Analysis of market trends judged to have modest problems; viability of analysis is questionable	Demonstrates a general competence regarding analysis of market trends. Analysis of market trends judged to have minor problems but analysis is viable	Demonstrates a thorough competence regarding analysis of market trends. Analysis of market trends udged to be high quality

Within a student's business plan, is the existing competition analyzed well?	Fails to demonstrate competence regarding existing competition. !Analysis of existing competition lacks logic or is not provided	Demonstrates a superficial competence regarding existing competition. Analysis of existing competition judged to have modest problems; viability of analysis is questionable	Demonstrates a general competence regarding analysis of existing competition. Analysis of existing competition judged to have minor problems but analysis is viable	Demonstrates a thorough competence regarding analysis of existing competition. !Analysis of existing competition uudged to be high quality

APPENDIX 8

Appendix 8

HOSP Assessment Rubrics Critical Thinking Skills (based on Bloom's Taxonomy)

Student: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ **Academic Term and Year** _____

Course, Number and Section _ _ _ _ _ _ _ _ _ _ _ _ _ **Date _ _ _ _ _ _ _ _ _ _ _**

	1: Unacceptable	**2: Marginal**	**3: Proficient**	**4: Advanced**
1. Knowledge	Paper does not exhibit previously-learned materials.	Paper exhibits some of the previously-learned basic materials on facts, terms and concepts	Paper exhibits most of the previously-learned materials on facts, terms and concepts.	Paper fully exhibits previously-learned materials on facts, terms and concepts clearly.
2. Comprehension	Paper does not demonstrate any understanding of facts and ideas.	Paper demonstrates some understanding of facts and ideas by organizing and stating main ideas	Paper demonstrates understanding by organizing, comparing, translating and interpreting	Demonstrates complete understanding by translating, interpreting and extrapolation.
3. Application	Paper does not solve problems to a new situation	Paper attempts to solve problems to a new situation by applying acquired knowledge.	Paper solves problems to a new situation by applying acquired knowledge, facts and techniques in a different way.	Paper solves multiple problems in a new situation by applying knowledge, facts and technique in different ways.
4. Analysis	Paper does not analyze and break information into parts by identifying causes.	Paper analyzes some of the basic elements into causes and relationships.	Paper analyzes most of the basic elements into causes and relationships.	Paper fully analyzes the basic information into elements by identifying causes and relationships.
5. Synthesis	Paper does not compile information in a different way to produce a new plan or alternative solution.	Paper partially compiles information to produce an alternative solution.	Paper synthesizes information in a different way to form a new plan, alternative solution or abstract relation.	Paper fully synthesizes information in a different way to produce a unique communication/ proposed set of abstract relations.

6. Evaluation	Paper does not make judgment about the value of information	Paper makes partial judgment about the value of information.	Paper makes judgment of the value of information and validity of ideas or quality of work.	Paper fully appraises the value of information and validity of ideas or quality of work and fully uses this value when reaching a conclusion.

Scoring: 18 or above: passing **Total Score:**_____

Does student pass this assessment test? Yes No

Comments:

Evaluator _ _ _ _ _ _ _ _ _ _ _ _ _ _ _