### SCCC Program-Level Student Learning Outcomes Assessment Action Plan: Year 1 of 5

**Program: Liberal Arts And Sciences: Science Emphasis – Meteorology Option (LAME-AS)**  
**Degree or Certificate: A.S. Degree**

**Offered at (check all that apply):** Ammerman  East  Grant  
**Submitted: April 26, 2013**

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<tr>
<td>PLO#1: Demonstrate knowledge of factual material essential to their discipline in science.</td>
<td>PHY130, CLO A: Apply the laws of classical mechanics in areas of linear kinematics and dynamics, force and work/energy concepts, conservation of linear and angular momentum, rotational kinematics and dynamics. PHY230, CLO A: Solve word Problems in the areas of gravity, electrostatics, DC circuits, capacitors, inductors and resistor, the effect of magnetic fields on charged particles and current elements and the origins of magnetic fields. CHE 133 CLO#3: Performing Computations involving stoichiometry under aqueous, non-aqueous and gaseous state. CHE 133 CLO#7: Understanding chemical bonding concepts including MO and VB theories and determining molecular geometries of molecules and ions using Lewis structures and VSEPR method.</td>
<td>Embedded question on exam close to the end of the semester.  AP Physics C: Electricity and Magnetism Exam applied as final exam.  Standardized national ACS test or Common Embedded Final Exam Questions</td>
<td>2/3 of our students will achieve a 70% or better on the embedded question.  2/3 of our students will achieve a 70% or better on the exam.  60% of our students will achieve a 50% or better on the ACS test or 2/3 of our students will achieve a 70% or better on the embedded multiple choice exams.</td>
<td>PHY130 will be assessed by Dec/13 and May/14. Results and statistics will be available by May 2014.  PHY230 will be assessed by Dec/13 and/or May/14. Results and statistics will be available by May 2014.  CHE 133 will be assessed in the Fall 2013 semester. The data collected at the end of the Fall 2013 semester will be analyzed and reported back to faculty in Spring 2014.</td>
<td>Anindita Ghosh  Glenda Denicolo  Thomas Breeden  Glenda Denicolo  Jonathan Brockman  Candice Foley  Vivek Kumar  Richa Prakash  Sharadha  Sambasivan  Zhong Wang</td>
<td>Results will be disseminated to faculty via email and then discussed at a follow-up college-wide meeting to be held early in the semester following the one in which the data were collected. Action Plans will be determined at that time and changes made that semester.</td>
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**Follow Up/Actions Taken:**
### SCCC Program-Level Student Learning Outcomes Assessment Action Plan: Year 2 of 5

**Program:** Liberal Arts And Sciences: Science Emphasis – Meteorology Option (LAME-AS)  
**Degree or Certificate:** A.S. Degree

**Offered at (check all that apply):**  
- [x] Ammerman  
- [x] East  
- [ ] Grant

**Submitted:** April 26, 2013

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| PLO#1: Demonstrate knowledge of factual material essential to their discipline in science. | MET101, CLOs: b. Find locations using latitude and longitude coordinates.  
c. Determine and analyze atmospheric temperature, pressure, density, and wind.  
d. Describe various cloud and fog types and their formation and the associated precipitation types.  
e. Analyze data on a weather map, including location of air masses and weather fronts.  
f. Describe the dynamics of thunderstorms, tornadoes, and hurricanes, and demonstrate the ability to forecast these phenomena. | Embedded questions on final exam. | 80% of majors will achieve a 60% or better on the embedded questions. | MET101 will be assessed in December 2014 and May 2015. Results and statistics will be available by May 2015. | Scott Mandia | Results will be disseminated to faculty via email and then discussed at a follow-up college-wide meeting to be held early in the semester following the one in which the data were collected. Action Plans will be determined at that time and changes made that semester. |
| **PLO#2: Apply the scientific process, including designing and conducting experiments and testing hypotheses;** | PHY132, CLO B: Use various laboratory instruments including computer---based data acquisition.  
PHY132, CLO C: Interpret and Manipulate graphical data including fits to linear and polynomial functions.  
PHY132, CLO D: Apply critical Thinking skills in analyzing Practical problems; take necessary Data and formulate solutions.  
PHY132, CLO E: Present the results of experiments as coherent reports including error analysis. | Laboratory report. | 2/3 of our students will meet or exceed standards on each of the topics covered in the scoring rubric. | PHY132 will be assessed by Dec/14 and May/15. Results and statistics will be available by May 2015. | **Anindita Ghosh**  
**Glenda Denicolo**  
**Thomas Breeden** | |
| **PLO#4: Prepare written reports in a standard scientific format;** | **PLO#5: Analyze and interpret quantitative scientific data;** | Laboratory Report with a standardized Rubric | 2/3 of our students will meet or exceed standards on each of | All classes except CHE 251 will be assessed in the Fall | **Keith Baessler**  
**Jonathan Brockman**  
**Michael England** | |
<p>| CHE 133 CLO#8: Performing basic laboratory operations involving: volumetric (titrations) and | | | | | |</p>
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<th>CHE 133 CLO #6</th>
<th>CHE 134 CLO #5</th>
<th>CHE 250 CLO #4,5,8</th>
<th>CHE 251 CLO #3,4</th>
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<td>Understanding some basic concepts of thermochemistry and performing the calculations on calorimetry and enthalpy</td>
<td>Performing basic laboratory operations involving: qualitative inorganic analysis, molecular mass determination, kinetics, chemical equilibrium, spectrophotometry, and use of a pH meter.</td>
<td>- Designing synthetic strategies for organic molecules using retrosynthetic analysis. - Interpreting infrared spectra - Maintaining a current and well-written laboratory notebook</td>
<td>Designing synthetic strategies for organic molecules using retrosynthetic analysis. Interpreting nuclear magnetic resonance and mass spectra.</td>
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<td>2014 semester. The data collected at the end of the Fall 2014 semester will be analyzed and reported back to faculty in Spring 2015.</td>
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<td>Candice Foley Vivek Kumar Richa Prakash Sharadha Sambasivan Zhong Wang</td>
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**Follow Up/Actions Taken:**

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## SC3C Program-Level Student Learning Outcomes Assessment Action Plan: Year 3 of 5

Program: **Liberal Arts And Sciences: Science Emphasis – Meteorology Option (LAME-AS)**  
Degree or Certificate: **A.S. Degree**

Offered at (check all that apply):  
- Ammerman  
- East  
- Grant

Submitted: **April 26, 2013**

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| PLO#1: Demonstrate knowledge of factual material essential to their discipline in science. | MET103, CLOs: a. Develop well-reasoned arguments for the long- and short-term causes of climate change  
b. Identify and classify past climate by analyzing various temperature proxies such as isotopic chemical signatures from ice cores and sediment, tree rings, corals, and boreholes  
c. Evaluate and describe the observed evidence for modern climate change  
d. Describe the relationship between atmosphere and oceans and demonstrate their application to climate change  
e. Describe the carbon budget and demonstrate its role in climate change  
f. Describe the radiative heat budget of Earth and evaluate the role of greenhouse gases in this budget  
g. Detail the impacts of climate change on humans and nature  
h. Evaluate and describe the various solutions for addressing modern day climate change and the increasing world energy needs | Embedded questions on final exam. | 80% of majors will achieve a 60% or better on the embedded questions. | MET103 will be assessed in December 2015 and May 2016. Results and statistics will be available by May 2016. | Scott Mandia | Results will be disseminated to faculty via email and then discussed at a follow-up college-wide meeting to be held early in the semester following the one in which the data were collected. Action Plans will be determined at that time and changes made that semester. |

| PLO#6: Perform laboratory skills specific to their discipline in science; | PHY132, CLO D: Apply critical thinking skills in analyzing practical problems; take necessary data and formulate solutions.  
PHY132, CLO B: Use various laboratory instruments including | A practical final laboratory exam. | 2/3 of our students will meet or exceed standards on each of the topics covered in the scoring rubric. | PHY132 will be assessed by Dec/14 and May/15. Results and statistics will be available by May 2015. | Anindita Ghosh Glenda Denicolo Thomas Breeden | |
CHE 133 CLO: Performing basic laboratory operations involving: volumetric (titrations) and gravimetric analysis, calorimetry, visible spectroscopy, visible spectrophotometry, boiling point and density measurements and using molecular modeling materials.

CHE 250 CLO: Performing basic laboratory operations such as distillation, crystallization, extraction, melting point determination, and chromatography. Synthesizing simple organic molecules in the laboratory and identifying unknown compounds.

Laboratory Experiment: Identify an unknown substance

2/3 of our students will meet or exceed standards on each of the topics covered in the scoring rubric

All classes will be assessed in the Fall 2015 semester. The data collected at the end of the Fall 2015 semester will be analyzed and reported back to faculty in Spring 2016

Keith Baessler
Jonathan Brockman
Michael England
Candice Foley
Vivek Kumar
Richa Prakash
Sharadha Sambasivan
Zhong Wang

Follow Up/Actions Taken:
**SCCC Program-Level Student Learning Outcomes Assessment Action Plan: Year 4 of 5**

**Program:** Liberal Arts And Sciences: Science Emphasis – Meteorology Option (LAME-AS)  
**Degree or Certificate:** A.S. Degree

**Offered at (check all that apply):** Ammerman  East  Grant  
**Submitted:** April 26, 2013

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<td>PLO#7: Evaluate and discuss contemporary science-related social and ethical issues, both locally and globally, using scientific knowledge and reasoning</td>
<td>MET103, CLOs: g. Detail the impacts of climate change on humans and nature h. Evaluate and describe the various solutions for addressing modern day climate change and the increasing world energy needs</td>
<td>Embedded questions on final exam.</td>
<td>80% of majors will achieve a 60% or better on the embedded questions.</td>
<td>MET103 will be assessed in December 2016 and May 2017. Results and statistics will be available by May 2017.</td>
<td>Scott Mandia</td>
<td>Results will be disseminated to faculty via email and then discussed at a follow-up college-wide meeting to be held early in the semester following the one in which the data were collected. Action Plans will be determined at that time and changes made that semester.</td>
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<td>CHE 134 CLO: Solving problems involving chemical equilibria, thermodynamics, electrochemistry and nuclear chemistry.</td>
<td>Homework Assignment or Embedded Test Question</td>
<td>2/3 of our students will meet or exceed standards on each of the topics covered in the scoring rubric</td>
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**Follow Up/Actions Taken:**
**SCCC Program-Level Student Learning Outcomes Assessment Action Plan: Year 5 of 5**

Program: *Liberal Arts And Sciences: Science Emphasis – Meteorology Option (LAME-AS)*  
Degree or Certificate: *A.S. Degree*

Offered at (check all that apply):  
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- East  
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Submitted: *April 26, 2013*

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<td>PLO#3: Read, understand, and critically review scientific papers;</td>
<td>MET103, CLO: c. Evaluate and describe the observed evidence for modern climate change</td>
<td>Written term paper on a scientific article.</td>
<td>80% of majors will achieve a 60% or better on each of the topics in the scoring rubric.</td>
<td>MET103 will be assessed in December 2017 and May 2018. Results and statistics will be available by May 2018.</td>
<td>Scott Mandia</td>
<td>Results will be disseminated to faculty via email and then discussed at a follow-up college-wide meeting to be held early in the semester following the one in which the data were collected. Action Plans will be determined at that time and changes made that semester.</td>
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<td>CHE 251 CLO: Describing the physical and chemical properties of the compounds listed above, including their methods of preparation and their reactions, with an emphasis on fundamental reaction mechanisms and stereochemistry. Designing synthetic strategies for organic molecules using retrosynthetic analysis.</td>
<td>Written Homework Assignment</td>
<td>2/3 of our students will meet or exceed standards on each of the topics covered in the scoring rubric</td>
<td>Assessed in the Spring 2018 semester. The data collected at the end of the Spring 2018 semester will be analyzed and reported back to faculty in Fall 2018</td>
<td>Keith Baessler Michael England</td>
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