Description of Course: Course includes response of swine to thermal environment, ventilation system design and analysis, heating and cooling systems and examples of various designs for all phases of production. Troubleshooting and energy analysis will be included as well.

Justification for Course: Poor environments in swine facilities can waste energy, deter growth and stress pigs in a way that makes them more susceptible to disease. Many graduating students have very little exposure to environmental systems prior to being hired.

Organization:
This course will be delivered via distance education. This course is comprised of 15 modules. Modules will be loaded (at the latest) by the dates below.

Course modules will be comprised of a short video to introduce the topic with PowerPoint. There will also be an assignment most weeks that students will be responsible for in that module. The purpose of the activities is to expand your learning for that specific module. Even though this class is online these activities will help you to apply the knowledge gained.

Student Learning Outcomes:
Upon successful completion of the course students will be have:
- gained a basic knowledge and appreciation influence of the thermal environment on the productivity of swine;
- acquired understanding of ventilation rates, ventilation system components and a basic understanding of the system workings in order to facilitate troubleshooting;
- increased their ability to apply knowledge of systems to various production phases;
- become knowledgeable of energy utilization issues in order to do basic energy audit analysis.
Assignments
Assignments will be given, generally one per week, and will be electronically submitted to the instructor for grading.

Examinations:
No exams will be given.

Grading:
Most homework will be worth 50 points. Assignments which are more difficult or require excess time to complete will be given 100 points. Point value will be displayed on the assignment sheet.

Grading scale will be as follows (as a worse case):

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<th>Letter grade</th>
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<tbody>
<tr>
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<td>98 - 100</td>
<td>C+</td>
<td>77 - 79</td>
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<tr>
<td>A</td>
<td>93 – 97</td>
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Schedule: (Approximate)
Each week, modules will be uploaded into “weekly” folders. Every effort will be made to load modules early to allow you to work at your own pace.

Week 1
Introduction to Course - This week will help students get settled into the course.
Module 1 - Understanding environmental impacts on production

Week 2
Module 2 – Animal Energetics
Module 3 – Building Heat Loss

Week 3
Module 4 – Psychrometrics
Module 5 – Ventilation rate determination – Heat Balances

Week 4
Module 6 – Ventilation rate determination – Moisture & CO2 Balances

Week 5
Module 7 – Mechanical ventilation system components
Module 8 – Mechanical ventilation system design – Fan Sizing

Week 6
Module 9 – Mechanical ventilation system design – Inlets and Heaters

Week 7
Module 10 – Mechanical ventilation system design – Controllers

Week 8
Module 11 – Example Systems – Nurseries & Farrowing
Week 9  
*Module 12* – Natural and hybrid ventilation systems  

Week 10  
*Module 13* – Example Systems – Gestation & Finishing  

Week 11  
*Module 14* – Energy Issues in Swine Housing  
*Module 15* – Maintenance & Alarm systems  

Week 12  
*Module 16* – Common Ventilation Problems (tentative)