

**Graduation Composition and Communication Requirement (GCCR)  
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

**RECEIVED**

FEB 25 2015

**I. General Information:**

OFFICE OF THE  
SENATE COUNCIL

College:	<u>Agriculture Food and Environment</u>	Department (Full name):	<u>Plant and Soil Sciences Horticulture</u>
Major Name (full name please):	<u>Horticulture, Plant and Soil Science</u>	Degree Title:	<u>Bachelor of Science in Horticulture, Plant and Soil Science</u>
Formal Option(s), if any:	<u>Horticulture Enterprise Management Turfgrass Science Crops and Livestock Crop, Soil and Horticulture Science</u>	Specialty Field w/in Formal Options, if any:	<u>none</u>
Requested Effective Date:	<u>FALL 2014, IF RECEIVED BY SENATE COUNCIL BY MONDAY, APRIL 7.</u>		
Contact Person:	<u>John Grove Robert Geneve</u>	Phone:	<u>7-5852 7-8601</u>
		Email:	<u>jgrove@uky.edu rgeneve@uky.edu</u>

**II. Parameters of the Graduation Composition and Communication Requirement (GCCR):**

The new GCCR replaces the old Graduation Writing Requirement. It is fulfilled by a course or courses specified within a B.A./B.S. degree program. As outlined in draft Senate Rule 5.4.3.1, the GCCR stipulates that students must successfully complete this requirement after achieving sophomore status and prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments produced in any given course designated as fulfilling some or all of the GCCR. The requirements for GCCR courses include:

- at least 4500 words of English composition (approximately 15 pages total);
- a formal oral assignment *or* a visual assignment;
- an assignment demonstrating information literacy in the discipline;
- a draft/feedback/revision process on GCCR assignments.

The program requirements for the GCCR include:

- at least one specific Program Student Learning Outcome for C&C outcomes;
- a plan for assessing both the writing and oral *or* visual components of the GCCR;
- clear goals, rubrics, and revision plans for GCCR implementation.

Upon GCCR approval, each program will have a version of the following specification listed with its Program Description in the University Bulletin:

***“Graduation Composition and Communication Requirement. Students must complete the Graduation Composition and Communication Requirement as designated for this program. Please consult a college advisor or program advisor for details. See also ‘Graduation Composition and Communication Requirement’ on p. XX of this Bulletin.”***

**III. GCCR Information for this Program (by requirement):**

<b>A. List the courses currently used to fulfill the old Graduation Writing Requirement:</b>
<u>WRD 203</u>
<b>B. GCCR Program Outcomes and brief description:</b>
1. Please specify the Major/Program Student Learning Outcomes (SLOs) pertaining to Composition & Communication and the GCCR requirement. These are <i>program</i> outcomes, not <i>course</i> outcomes. Please specify the program-level SLOs for C&C in your program:
<u>The Horticulture Plant and Soil Sciences major describes five student learning outcomes in three major areas: Knowledge, Professional Skills and Perspective. The SLOs pertaining to the GCCR requirement are in the Professional Skills category: Professional Skills</u>
3. <u>Students will communicate clearly in oral and written formats.</u>
4. <u>Given a situation, students will define the problem, retrieve and evaluate information, propose, and evaluate potential</u>

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solutions.

2. Please provide a short GCCR description for your majors (limit 1000 characters): Please explain the GCCR requirement in language appropriate for undergraduate majors to understand the specific parameters and justification of your program's GCCR implementation plan:

PLS 490 Topics in Plant and Soil Science is the capstone course required of all students majoring in Horticulture, Plant and Soil Science. The course will provide you the opportunity to integrate knowledge acquired in previous courses while emphasizing problem solving, synthesizing and integrating information, critical thinking, group activities, and written and oral communication. You will draft, receive feedback on, and revise a written project in a capstone section appropriate to your interest (for example, research summary of independent research, horticulture enterprise business plan, proposal for golf course improvement project, etc.) and, based on that written project, develop, practice, and revise an oral presentation supported by visual aids.

**C. Delivery and Content:**

1. **Delivery specification:** for your major/program, how will the GCCR be delivered? Please put an X next to the appropriate option. (Note: it is strongly recommended that GCCR courses be housed within the degree program.)

- a. Single required course within program
- b. multiple required or optional courses within program
- c. course or courses outside program (i.e., in another program)
- d. combination of courses inside and outside program
- e. other (please specify): \_\_\_\_\_

2. **Basic Course Information:** Please provide the following information for course(s) used to satisfy the GCCR, either in whole or in part:

**Course #1:** Dept. prefix, number, and course title: PLS 490 Topics in Plant and Soil Science

- new or existing course? Existing (new courses should be accompanied by a New Course Proposal)
  - if a new course, check here that a New Course Proposal has been submitted for review via eCATS
- required or optional? required
- shared or cross-listed course? no
- projected enrollment per semester: 4 per section

**Course #2 (if applicable):** Dept. prefix, number, and course title: \_\_\_\_\_

- new or existing course? \_\_\_\_\_ (new courses should be accompanied by a New Course Proposal)
  - if a new course, check here that a New Course Proposal has been submitted for review via eCATS
- required or optional? \_\_\_\_\_
- shared or cross-listed course? \_\_\_\_\_
- projected enrollment per semester: \_\_\_\_\_

**Course #3 (if applicable):** Dept. prefix, number, and course title: \_\_\_\_\_

- new or existing course? \_\_\_\_\_ (new courses should be accompanied by a New Course Proposal)
  - if a new course, check here that a New Course Proposal has been submitted for review via eCATS
- required or optional? \_\_\_\_\_
- shared or cross-listed course? \_\_\_\_\_
- projected enrollment per semester: \_\_\_\_\_

3. **Shared courses:** If the GCCR course(s) is/are shared from *outside* the program, please specify the related department or program that will be delivering the course(s). Please provide the following:

- **Contact information of providing program:**  
\_\_\_\_\_
- **Resources:** what are the resource implications for the proposed GCCR course(s), including any projected budget or staffing needs? If multiple units/programs will collaborate in offering the GCCR course(s), please specify the resource contribution of each participating program.  
\_\_\_\_\_
- **Memorandum of Understanding/Letter of Agreement:** Attach formal documentation of agreement between the providing and receiving programs, specifying the delivery mechanisms and resources allocated for the specified GCCR course(s) in the respective programs (include with attachments).

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Date of agreement: \_\_\_\_\_

**4. Syllabi:** Please provide a sample syllabus for each course that will be designated to fulfill the GCCR. Make sure the following things are clearly indicated on the syllabi for ease of review and approval (check off each):

- the GCCR assignments are highlighted in the syllabus and course calendar;
- the GCCR assignments meet the minimum workload requirements as specified by the Senate Rules for GCCR courses (see the draft Senate GCCR rule linked [here](#));
- the elements are specified in the syllabus that fulfill the GCCR requirement for a clear draft/feedback/revision process;
- the grade level requirements for the GCCR are specified on the syllabus (i.e., an average of C or better is required on GCCR assignments for credit);
- the course or sequence of courses are specified to be completed after the first year (i.e. to be completed after completing 30 credit hours) for GCCR credit;
- the course syllabus specifies "This course provides full/partial GCCR credit for the XXX major/program"
  - if the course provides partial GCCR credit, the fulfilled portion of the GCCR must be specified and the other components of the GCCR for the program must be specified: e.g. "This course provides partial credit for the written component of the GCCR for the XXX major/program in conjunction with Course 2"

**5. Instructional plan:** Summarize the instructional plan for teaching the C&C skills specified in the program SLOs and delivered in the course(s). Include the following information in **brief** statements (1000 characters or less). Information can be cut-and-pasted from the relevant sample syllabus with indications **where** on the syllabus it is found:

- overview of delivery model: summarize how the GCCR will be delivered for all program majors: explain how the delivery model is appropriate for the major/program and how it is offered at an appropriate level (e.g. required course(s), capstone course, skills practicum sequence of courses, etc.):

PLS 490 is our required senior capstone course. Multiple sections of the course are offered in order to tailor the capstone experience to the differing objectives of the students. Thus the student enrollment in any section is usually 5 or fewer students. This allows each instructor enough time per student for individual instruction, review, and revision of the communication components of the GCCR.

- assignments: overview or list of the assignments to be required for the GCCR (e.g. papers, reports, presentations, videos, etc.), with a summary of how these GCCR assignments appropriately meet the disciplinary and professional expectations of the major/program:

Each section of PLS 490 will require an information literacy assignment, a major written project (with a total word count across all assignments equal to or greater than 4,500 words), and an oral presentation of at least 10 minutes based on the written project. The specifics of each assignment will be defined for each section. For example, a section of the course for a student pursuing the Horticulture Enterprise Management option would require: Review and summarize four Kentucky Small Business Development Center training modules and provide a 400 word summary of each (1600 words total). Create a customized business overview and plan based on the KSBDC model (4000 words) and present the plan to the class as a PowerPoint presentation (~15 minutes).

- revision: description of the draft/feedback/revision plan for the GCCR assignments (e.g. peer review with instructor grading & feedback; essay drafting with mandatory revision; peer presentations; etc.):

Revision

Each section of PLS 490 will provide feedback for revision of the written assignments and the oral presentation. For example the course schedule in the attached syllabus for a student in the Crops and Livestock option indicates- A rough draft of the written project will be due on Wednesday 12 March and will be returned by email on Monday 17 March. The written project will be due Monday 21 April. Oral rough drafts will be due on 26 March and written/oral feedback will be provided that day.

- other information helpful for reviewing the proposal:

A generic syllabus for PLS 490 which meets the GCCR is attached. This syllabus will be modified and enhanced for every future section of PLS 490. Three draft syllabi are attached which show how the past three sections of PLS 490 would be modified to meet the GCCR. Adapting PLS 490 to meet GCCR requires specific additions to the expectations and syllabi but does not change the intent, general expectations, and practice of the course as it has been previously taught.

**D. Assessment:**

In addition to providing the relevant program-level SLOs under III.B, please specify the assessment plan at the program level for the proposed course(s) and content. Provide the following:

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<ul style="list-style-type: none"><li>• specify the assessment schedule (e.g., every 3 semesters; biennially): <u>biennially</u></li></ul>
<ul style="list-style-type: none"><li>• identify the internal assessment authority (e.g. curriculum committee, Undergraduate Studies Committee): <u>Director of Undergraduate Studies from the Department of Horticulture (currently Robert Geneve) and from the Department of Plant and Soil Sciences (currently John Grove)</u></li></ul>
<ul style="list-style-type: none"><li>• if the GCCR course(s) is/are shared, specify the assessment relationship between the providing and receiving programs: explain how the assessment standards of the receiving program will be implemented for the provided course(s): <u>NA</u></li></ul>

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**Signature Routing Log**

**General Information:**

GCCR Proposal Name (course prefix & number, program major & degree):	PLS 490 Topics in Plant and Soil Science, Horticulture, Plant and Soil Science, B.S. in Horticulture Plant and Soil Science
Contact Person Name:	John Grove Robert Geneve
Phone:	7-5852 7-8601
Email:	jgrove@uky.edu rgeneve@uky.edu

**Instructions:**

Identify the groups or individuals reviewing the proposal; record the date of review; provide a contact person for each entry. On the approval process, please note:

- Proposals approved by Programs and Colleges will proceed to the GCCR Advisory Committee for expedited review and approval, and then they will be sent directly to the Senate Council Office. Program Changes will then be posted on a web transmittal for final Senate approval in time for inclusion in the Fall 2014 Course Bulletin.
- New Course Proposals for the GCCR will still require review and approval by the Undergraduate Council. This review will run parallel to GCCR Program Change review.
- In cases where new GCCR courses will be under review for implementation after Fall 2014, related GCCR Program Changes can still be approved for Fall 2014 as noted "*pending approval of appropriate GCCR courses.*"

**Internal College Reviews and Course Sharing and Cross-listing Reviews:**

Reviewing Group	Date Reviewed	Contact Person (name/phone/email)
Home Program <i>review by Chair or DUS, etc.</i>	10/22/14	John Grove / 7-5852 / jgrove@uky.edu Robert Geneve / 7-8601 / rgeneve@uky.edu
Providing Program <i>(if different from Home Program)</i>		/ /
Cross-listing Program <i>(if applicable)</i>		/ /
College Dean	10/24/14	Larry Grabau / 7-3469 / lgrabau@uky.edu
		/ /

**Administrative Reviews:**

Reviewing Group	Date Approved	Approval of Revision/ Pending Approval <sup>1</sup>
GCCR Advisory Committee	11/05/2014	

**Comments:**

<sup>1</sup> Use this space to indicate approval of revisions made subsequent to that group's review, if deemed necessary by the revising group; and/or any Program Change approvals with GCCR course approvals pending.

October 27, 2014

To: UK GCCR committee

From: Horticulture, Plant and Soil Science Undergraduate Program

Re: Graduation Composition and Communication Requirement Proposal

The Horticulture, Plant and Soil Science undergraduate program is a small program, averaging nine graduates per year from 2008-2009 to 2012-2013. Our program, however, has four option areas, and students enrolled in those different options have a diversity of interests, from farming, to managing a golf course, to running a small business, etc. So over the past 20 years our capstone course, PLS 490 Topics in Plant and Soil Science, has been offered as multiple sections to meet those student interests. Like many capstone courses in the College of Agriculture, Food and Environment PLS 490 sections have been independent study/research intensive and presentation based. Dividing nine graduates among multiple sections of the capstone course creates a small student/faculty ratio. Thus students have the opportunity for, and benefit from, considerable interaction with the faculty member leading the capstone course. In this format our capstone course is our choice to meet the GCCR, providing horticulture, crop and soil science context specific writing and speaking activities.

Along with the GCCR proposal form, our proposal consists of a generic syllabus and three example syllabi. The generic syllabus includes the elements necessary to meet the GCCR. Those elements will all be included in future syllabi, but the GCCR activities may be designed to address the focus of any specific capstone section. Along with the generic syllabus, three syllabi are presented which show how the three most recent sections of PLS 490 could have been designed to fit into the generic syllabus. The majority of the activities in those three syllabi were the activities already required and evaluated in the previous sections of PLS 490.

Thank you for considering our proposal.

**DRAFT**

**Syllabus**  
**PLS 490-section**  
(Topics in Plant and Soil Science XXX Option)  
Semester

**This course provides full GCCR credit for the Horticulture, Plant and Soil Science major**

Instructor:  
Office:  
Telephone:  
e-mail:  
Office Hours:

**Course Description**

A capstone course for majors in Horticulture, Plant and Soil Science to be taken near the conclusion of the student's academic career. The course provides the student the opportunity to integrate knowledge acquired in previous courses in the plant and soil science and support areas. Emphasis will be placed on problem solving, synthesizing and integrating information, critical thinking, group activities, and written and oral communication. Prerequisite – senior in Horticulture, Plant and Soil Science and have completed the Composition and Communication requirement in the UK Core. Students must successfully complete the Graduation Composition and Communication Requirement prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments within this course.

**Course Objectives**

(as appropriate to the option area).

**Learning outcomes\***

Upon completion of this course the student will demonstrate the ability to

- 1) search appropriate information sources related to their chosen project
- 2) develop a coherent project
- 3) effectively communicate the results of their chosen project
- 4) as appropriate to the option area

\*These may be modified to meet the expectations of a particular section, and additional section specific student learning outcomes may be added. For example a section of PLS 490 for a student pursuing the Crop, Soil, and Horticulture Science option may modify these SLOs to read:

Upon completion of this course the student will demonstrate the ability to

- 1) search appropriate scientific literature related to their chosen research project
- 2) design, conduct and evaluate original research related to the project
- 3) effectively communicate the results of their research project

**Course meeting times and location**

**Text Required**

## Course Activities

-Information literacy activity such as an annotated bibliography, literature summary/review, etc.

-Writing assignment(s) [with a total of at least 4500 words] draft, feedback, revision, and final version

-Oral assignment(s) [at least 10 minutes] draft/practice, feedback, and final presentation

Or

-Visual Artifact with a draft, feedback, and revision for final process.

-Section specific activities

## Grading

### Points

### % of Final Grade

Information literacy activity

Written assignment(s)

Oral assignment(s)

Section specific assignments

Letter grades will be assigned according to the following scale, with percentages rounded to the nearest whole number.

<u>Percent</u>	<u>Grade</u>
90-100	A
80-89	B
70-79	C
60-69	D
<60	E

## GCCR credit

An average of C or better is required on GCCR assignments for you to earn GCCR credit. GCCR assignments include the following:

Information literacy activity

Writing assignment(s) [with a total of at least 4500 words]

Oral assignment(s) [at least 10 minutes]

Or

Visual Artifact assignment (e.g. website or video presentation)

## Course Policies

### Class Attendance

Instructor defines

### Academic Integrity

University policy, Student Rights and Responsibilities, instructor includes as desired

### Accommodations due to disability

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.



## Course Schedule

Activities for GCCR credit are highlighted.

<u>Date</u>	<u>Topic</u>	<u>Assignments</u>
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## **DRAFT EXAMPLE**

### **Syllabus PLS 490-002**

(Topics in Plant and Soil Science – Crops and Livestock Option)

Spring 2016

**This course provides full GCCR credit for the Horticulture, Plant and Soil Science major**

Instructor:  
Office:  
Telephone:  
e-mail:  
Office Hours:

### **Course Description**

A capstone course for majors in Horticulture, Plant and Soil Science to be taken near the conclusion of the student's academic career. The course provides the student the opportunity to integrate knowledge acquired in previous courses in the plant and soil science and support areas. Emphasis will be placed on problem solving, synthesizing and integrating information, critical thinking, group activities, and written and oral communication. Prerequisite – senior in Horticulture, Plant and Soil Science and have completed the Composition and Communication requirement in the UK Core. Students must successfully complete the Graduation Composition and Communication Requirement prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments within this course.

### **Course Objectives**

To further the understanding of practices and skills involved in professional agronomy. Topics of study will include preparation for the Kentucky and International Certified Crop Advisor exams.

### **Learning outcomes**

Upon completion of this course the student will demonstrate the ability to

- 1) search appropriate information sources related to their chosen project
- 2) develop a coherent project
- 3) effectively communicate the results of their chosen project
- 4) pass an appropriate professional certification exam

### **Course meeting times and location**

11:00-11:50 MW

Room 460 Plant Science Bldg.

### **Text Required**

None

## Course Activities

- Information literacy activity – Provide 10 references for your written project accompanied by a written evaluation of the validity/strength of each reference.
- Writing assignment – The writing assignment requires a total of at least 4500 words. You will provide a draft paper, receive feedback on your writing, revise your draft based on the feedback, and submit your paper. The subject of your paper will be agreed upon by the student and the instructor. The writing assignment rubric is attached to this syllabus.
- Oral assignment – The oral presentation (at least 10 minutes) summarizes for the class the written project agreed upon by the student and the instructor. Before making your presentation you will provide a draft of your oral presentation, receive feedback on your draft, and revise your presentation based on the feedback.
- Certified Crop Advisor Exam activities  
Pretests and post-tests for study sections of the Kentucky and national Certified Crop Advisor certification exams.

<u>Grading</u>	<u>Points</u>	<u>% of Final Grade</u>
Information literacy activity	25	9%
Project outline	25	9%
Project – written and oral drafts	25	9%
Written assignment	100	36%
Oral assignment	100	36%

Letter grades will be assigned according to the following scale, with percentages rounded to the nearest whole number.

<u>Percent</u>	<u>Grade</u>
90-100	A
80-89	B
70-79	C
60-69	D
<60	E

## GCCR credit

All assignments in this course address the Graduation Composition and Communication Requirement. Therefore, a C or better course grade is required for you to earn GCCR credit. GCCR assignments include the following:

- Information literacy activity – Provide 10 references for your written project accompanied by a written evaluation of the validity/strength of each reference.
- Writing assignment – The writing assignment requires a total of at least 4500 words. You will provide a draft paper, receive feedback on your writing, revise your draft based on the feedback, and submit your paper. The subject of your paper will be agreed upon by the student and the instructor. The writing assignment rubric is attached to this syllabus.
- Oral assignment – The oral presentation (at least 10 minutes) summarizes for the class the written project agreed upon by the student and the instructor. Before making your presentation you will provide a draft of your oral presentation, receive feedback on your draft, and revise your presentation based on the feedback.

## **Course Policies**

### **Class Attendance**

Acceptable reasons for excused absences are listed in Student Rights and Responsibilities.

### **Academic Integrity**

Please refer to your copy of Student Rights and Responsibilities for University policy regarding cheating and plagiarism. Be aware that the minimum penalty for either of these offenses is a grade of "E" for the course.

### **Accommodations due to disability**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

## Course Schedule\*

Activities for GCCR credit are highlighted.

<u>Date</u>	<u>Topic</u>	<u>Assignments</u>
Week 1	Introduction and decide on individual projects	
Week 2	Nutrient management - pretest Nutrient management	
Week 3	Nutrient management – post-test Soil and water management - pretest	
Week 4	Soil and water management Soil and water management – post-test	
Week 5	Pest management – pretest Pest management	Paper/presentation outlines
Week 6	Pest management – post-test Cropping systems management - pretest	
Week 7	Cropping systems management Cropping systems management – post-test	Information literacy assignment
Week 8	Nutrient management - pretest Nutrient management – post-test	
Week 9	Soil and water management - pretest Soil and water management – post -test	Paper draft
Week 10	Spring break	
Week 11	Crop management - pretest Crop management – post-test	Presentation draft
Week 12	Integrated pest management (KY) - pretest Integrated pest management (KY) – post-test	
Week 13	Integrated pest management (national) - pretest Integrated pest management (national) – post-test	
Week 14	Certified Crop Advisors - CEUs Certified Crop Advisors - CEUs	
Week 15	Project oral reports	Paper due / oral reports Oral reports
Week 16	Basic statistics	

\*As an example, here would have been the assignment and feedback dates when the course was taught in 2014. A rough outline for each project will be due on Wednesday 12 February and will be returned by email on Monday 17 February. A rough draft of the written project will be due on Wednesday 12 March and will be returned by email on Monday 17 March. The written project will be due Monday 21 April. Oral rough drafts will be due on 26 March and written/oral feedback will be provided that day. Oral presentations will be presented in random order Monday 21 April. Your reference assignment will be due by email on 26 February.

# WRITTEN COMMUNICATION

*for more information, please contact*

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Written communication is the development and expression of ideas in writing. Written communication involves learning to write. Written communication abilities develop through iterative experiences across the curriculum.

*Evaluators are encouraged to assign a zero to any work sample or a*

	Capstone 4	3 Milestone
<b>Context of and Purpose for Writing</b> <i>Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</i>	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).
<b>Content Development</b>	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.
<b>Genre and Disciplinary Conventions</b> <i>Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).</i>	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (s) including organization, content, presentation, formatting, and stylistic choices	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices
<b>Sources and Evidence</b>	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.
<b>Control of Syntax and Mechanics</b>	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.

# ORAL COMMUNICATION

*for more information, please contact*

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Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to pr

*Evaluators are encouraged to assign a zero to any work sample or a*

	Capstone 4	3 Milest
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.

## **DRAFT EXAMPLE**

### **Syllabus PLS 490-001**

(Topics in Plant and Soil Science – Horticulture Enterprise Management Option)  
Fall 2015

**This course provides full GCCR credit for the Horticulture, Plant and Soil Science major**

Instructor:  
Office:  
Telephone:  
e-mail:  
Office Hours:

### **Course Description**

A capstone course for majors in Horticulture, Plant and Soil Science to be taken near the conclusion of the student's academic career. The course provides the student the opportunity to integrate knowledge acquired in previous courses in the plant and soil science and support areas. Emphasis will be placed on problem solving, synthesizing and integrating information, critical thinking, group activities, and written and oral communication.

Prerequisite – senior in Horticulture, Plant and Soil Science and have completed the Composition and Communication requirement in the UK Core. Students must successfully complete the Graduation Composition and Communication Requirement prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments within this course.

### **Course Objectives**

Investigate in detail a horticultural field by shadowing a horticultural professional. Demonstrate your understanding of that field in a presentation to first-year horticulture students.

Demonstrate your understanding of managing a horticultural enterprise by preparing a customized business plan for a proposed horticultural business.

### **Learning outcomes**

Upon completion of this course the student will demonstrate the ability to

- 1) search for appropriate information concerning horticultural business opportunities
- 2) apply standard business principles to horticultural situations
- 3) communicate effectively with peers regarding experiential learning activities
- 4) understand and appreciate the diverse nature of horticulture production

### **Course meeting times and location**

The class physically meets on Thursdays 4:00-4:45 in AGS N-320. Students will be required to do significant independent study associated with this course. Students will make PowerPoint presentations regarding their shadowing experience to PLS 100 – Introduction to Horticultural Professions tentatively scheduled for week 13 of the semester from 4:00-4:50 in AGN N320.



## Text Required

No text is required for this course. Initial reference materials are found at the Kentucky Small Business Development Center web site [http://www.va-interactive.com/sbdc/ot/modules.php?state\\_name=KY](http://www.va-interactive.com/sbdc/ot/modules.php?state_name=KY)

## Course Activities

### Information literacy activity

- Students should review the training modules of the Kentucky Small Business Development Center, [http://www.va-interactive.com/sbdc/ot/modules.php?state\\_name=KY](http://www.va-interactive.com/sbdc/ot/modules.php?state_name=KY) as they relate to development of the Business Plan. Students should have reviewed and be ready to discuss one or more of the modules prior to each scheduled class time as dictated by the instructor. You must find additional information sources which allow you to apply the particular module to horticulture production, sales or management. In class participation in discussing these modules will be assessed.

### Writing and oral assignments

- Students will participate in a one-day (~ 6-8 hour) shadowing experience where they will observe a professional in a particular field of horticulture. The instructor will help the student identify and initiate the shadowing experience. Students will develop both a written assessment and formal oral presentation of their shadowing experience. Participation in the shadowing experience, written assessment, and oral presentation will be assessed. Students will make PowerPoint presentations regarding their shadowing experience to PLS 100 – Introduction to Horticultural Professions, course details are given above in **Course meeting times and locations**.
- Students will complete a Customized Business Overview and Plan (Business Plan) relating to a business they may hope to develop in the future. Students must follow the KSBDC worksheet discussed in class: <http://www.va-interactive.com/sbdc/ot/modules/businessplan/worksheet.html>. Rough drafts or discussions of the assignment will be due throughout the semester. Feedback will be provided by the instructor and revisions of the business will be expected. The assignment will culminate with a formal presentation (written report and oral PowerPoint) that details the student's plan for the instructor and classmates.

<u>Grading</u>	<u>Points</u>	<u>% of Final Grade</u>
Information literacy activity – in class discussion participation	10	10
Shadowing experience written assessment	20	20
Shadowing experience oral presentation	20	20
Business plan written report	30	30
Business plan oral presentation	30	30

Letter grades will be assigned according to the following scale, with percentages rounded to the nearest whole number.

<u>Percent</u>	<u>Grade</u>
90-100	A
80-89	B
70-79	C
60-69	D

## **GCCR credit**

All assignments in this course address the Graduation Composition and Communication Requirement. Therefore, a C or better course grade is required for you to earn GCCR credit. GCCR assignments include the following:

### **Shadowing experience**

Students conduct preliminary research to search for shadowing opportunities in/around Lexington and consult with the instructor to select a mentor. Individual students have a single day shadowing experience where they are immersed into the language and culture of horticultural production, sales, or management of public landscapes.

There is a preliminary written report (1200 words) that describes their shadowing experience. This report is evaluated and students resubmit a final shadowing evaluation report.

Students prepare a draft of their oral report in PowerPoint that describes their shadowing experience.

Students receive feedback on their presentation during a one-on-one session with the instructor. Students then deliver their final oral report (5-10 minutes) to students in PLS 100 – Introduction to Horticultural Professions.

### **Kentucky Small Business Development Center training modules**

Students review and summarize at least 4 modules of the KSBDC and in oral discussions present this to the rest of the class. They are specifically tasked with finding and using additional information sources to apply the particular module to horticulture production, sales or management.

Students provide a one-page summary of each of the 4 modules (1600 words total).

### **Customized Business Overview and Plan (Business Plan)**

Students follow an outline/worksheet from the Kentucky Small Business Development Center web site that includes a detailed description of elements to develop a business plan. Throughout the semester students complete various sections of the plan, discuss their ideas in class, and turn in a rough draft of each section for comments (500 words each). These commented sections of the business plans are used to develop the final business plan that is at least 4,000 words and typed.

The business plan is presented as a PowerPoint presentation to the class (~15 minutes). There is a draft-feedback-revise process for this presentation that occurs during Week 15 with revised final presentations during Week 16.

## **Course Policies**

### **Class Attendance**

As many of the assignments have in-class presentation/discussion components, class attendance and participation in discussion is required. Points will be deducted for poor class attendance without prior discussion with the instructor.

## **Academic Integrity**

Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website:

<http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online

<http://www.uky.edu/StudentAffairs/Code/part2.html>) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic (<http://www.uky.edu/Ombud/Plagiarism.pdf>). However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

**Please note:** Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

## **Accommodations due to disability**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: [jkarnes@email.uky.edu](mailto:jkarnes@email.uky.edu)) for coordination of campus disability services available to students with disabilities.

## Course Schedule

Activities for GCCR credit are highlighted.

<u>Date</u>	<u>Topic</u>	<u>Assignments</u>
Week 1	Course introduction	
Week 2	'Starting Your Business' modules	one page training module summary
Week 3	Shadowing and business plan topics	
Week 4	"Starting Your Business" modules	one page training module summary
Week 5	'Managing Your Finances' modules	
Week 6	Shadowing	
Week 7	'Managing Your Finances' modules	one page training module summary
Week 8	'Foundations of Marketing' modules	Shadowing preliminary report
Week 9	'Foundations of Marketing' modules	one page training module summary
Week 10	Discuss business plan ideas	Shadowing final report
Week 11	Discuss business plan ideas	Draft business plan
Week 12	Preview shadowing presentations	Draft shadowing presentations
Week 13	Shadow presentations	Present to PLS 100
Week 14	Thanksgiving Break	
Week 15	Business plan presentations	Business plan presentation practice
Week 16	Business plan presentations	Final written business plans due Business plan presentation

**DRAFT**

**Syllabus  
PLS 490-003**

(Topics in Plant and Soil Science - Crop, Soil and Horticulture Science Option)  
Spring 2016

**This course provides full GCCR credit for the Horticulture, Plant and Soil Science major**

Instructor:  
Office:  
Telephone:  
e-mail:  
Office Hours:

**Course Description**

A capstone course for majors in Horticulture, Plant and Soil Science to be taken near the conclusion of the student's academic career. The course provides the student the opportunity to integrate knowledge acquired in previous courses in the plant and soil science and support areas. Emphasis will be placed on problem solving, synthesizing and integrating information, critical thinking, group activities, and written and oral communication. Prerequisite – senior in Horticulture, Plant and Soil Science and have completed the Composition and Communication requirement in the UK Core. Students must successfully complete the Graduation Composition and Communication Requirement prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments within this course.

**Course Objectives**

The course provides the student the opportunity to apply knowledge acquired in previous courses to a research problem.

**Learning outcomes**

Upon completion of this course the student will demonstrate the ability to

- 1) search appropriate scientific literature related to their chosen research project
- 2) design, conduct and evaluate original research related to the project
- 3) effectively communicate the results of their research project

**Course meeting times and location**

There are no set meeting times for this course.

**Text Required**

There is no text required for this course

## Course Activities

### Information literacy activity

- Students are required to prepare a research proposal for their capstone research project. The proposal should include a title, an introduction (background literature review), specific objectives, proposed method for specific experiments, literature cited, and a timetable for completing the project. The proposal should be submitted in draft form to the mentoring faculty member, and revised according to the suggestions provided by the mentor. Research proposal and literature search (1000 words) will be evaluated according to the rubric in the appendix. Students will receive an initial grade for the preliminary submission and the grade can be modified based upon the quality of the revision.

### Research Study

- After acceptance of the proposal by your mentor, the student will physically conduct those studies agreed upon in the proposal. The research must be conducted under the direction of the mentor. During this time, the student must submit a copy of their lab results once per month. This portion of the project will be graded on research effort and the timely progress of the research.

### Writing assignment

- The student will produce a written paper in an accepted scientific manuscript format (4000 words). The paper must be submitted in preliminary format and revised into a final communication. The preliminary submission will be evaluated according the second rubric in the appendix. Students will receive an initial grade that can be modified based upon the quality of the revision.

### Oral assignment

- The final requirement is for the student to communicate the results of their research. This could be a presentation (oral - at least 10 minutes or poster) at a state, regional or national meeting. Otherwise the student will complete the oral assignment for the research mentor and the course instructor. The presentation must be submitted and practiced in preliminary format and revised into a final presentation. Oral or poster presentation will be submitted in a preliminary form and will be revised until the final communication meets a professional standard.

<u>Grading</u>	<u>Points</u>	<u>% of Final Grade</u>
Information literacy activity	30	30
Written assignment	30	30
Oral assignment	10	10
Research study	30	30

Letter grades will be assigned according to the following scale, with percentages rounded to the nearest whole number.

<u>Percent</u>	<u>Grade</u>
90-100	A
80-89	B
70-79	C
60-69	D
<60	E

**GCCR credit**

An average of C or better is required on GCCR assignments for you to earn GCCR credit. GCCR assignments include the following:

**Information literacy activity**

- Students are required to prepare a research proposal for their capstone research project. The proposal should include a title, an introduction (background literature review), specific objectives, proposed method for specific experiments, literature cited, and a timetable for completing the project. The proposal should be submitted in draft form to the mentoring faculty member, and revised according to the suggestions provided by the mentor. Research proposal and literature search (1000 words) will be evaluated according to the rubric in the appendix. Students will receive an initial grade for the preliminary submission and the grade can be modified based upon the quality of the revision.

**Writing assignment**

- The student will produce a written paper in an accepted scientific manuscript format (4000 words). The paper must be submitted in preliminary format and revised into a final communication. The preliminary submission will be evaluated according the second rubric in the appendix. Students will receive an initial grade that can be modified based upon the quality of the revision.

**Oral assignment**

- The final requirement is for the student to communicate the results of their research. This could be a presentation (oral - at least 10 minutes or poster) at a state, regional or national meeting. Otherwise the student will complete the oral assignment for the research mentor and the course instructor. The presentation must be submitted and practiced in preliminary format and revised into a final presentation. Oral or poster presentation will be submitted in a preliminary form and will be revised until the final communication meets a professional standard.

**Course Policies****Class Attendance**

Attendance is based on the expectation of the research mentor. A prior agreement with the research mentor outlining the expected effort for completion of the research project is suggested.

**Academic Integrity**

Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

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When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic (<http://www.uky.edu/Ombud/Plagiarism.pdf>). However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

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If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: [jkarnes@email.uky.edu](mailto:jkarnes@email.uky.edu)) for coordination of campus disability services available to students with disabilities.

#### **Course Schedule**

Activities for GCCR credit are highlighted.

In order to accomplish the course objectives, students are required to develop an appropriate undergraduate research project under the guidance of a mentor in the Department of Horticulture or Department Plant and Soil Sciences. Mentors from other departments such as Entomology, Plant Pathology, or Biosystems and Agricultural Engineering may also be considered as well as an appropriate industry researcher. This can be accomplished by:

The suggested timetable for completion of the capstone project follows:

1. Meet with the HPLS Science Area of Emphasis coordinator (currently xxxx) in September of your junior year to discuss your interests and identify a mentor.
2. Start a conversation with your mentor about a research project.
3. Plan to have a completed research proposal by the end of your junior year.
4. During your senior year, conduct the research and write up your results.
5. Communicate those results prior to graduation in oral and written form.
6. Enroll in capstone (PLS 490) in the semester you plan to communicate your project.



## Appendix 1 - Rubric for grading the research proposal

<b>Proposal section</b>	<b>Full credit (10 pts)</b>	<b>Partial credit (8 pts)</b>	<b>Minimal or no credit (6 pts)</b>
Objective statement (15 pts)	Objective statement is clear and realistic.	Objective statement is not clear or realistic.	No objective statement is present
Literature (20 pts)	Includes 6-12 primary journal papers relevant to the proposed study	Your title is clear, but may not be clear and concise, but does reference the research topic and plant studied.	Your title is not clear and concise and lacks reference to the research topic and plant studied.
Introduction (25 pts)	<b>Full credit (15 pts)</b>	<b>Partial credit (12 pts)</b>	<b>Minimal credit (6 pts)</b>
	Uses appropriate literature to provide adequate background on the research subject.	Background is not adequately provided.  References are not appropriate to the subject.  Objective statement is not clearly stated.	Background is brief and does not adequately cover the subject.  Less than 3 appropriate references.  Objective statement missing or inadequate.
Experimental plan (20 pts)	<b>Full credit (15 pts)</b>	<b>Partial credit (12 pts)</b>	<b>Minimal credit (6 pts)</b>
	Outlines an achievable experimental plan.  Includes a time table for completing the research.  Describes how and what data was collected.	Experimental plan is not clearly designed  Description of data collection is not complete.	Experimental plan is not clearly designed  The time table is not realistic.  Description of data collection is lacking.
<b>Writing competence</b>	<b>Full credit (5 pts)</b>	<b>Partial credit (4 pts)</b>	<b>Minimal credit (3 pts)</b>
Organization (10 pts)	The proposal follows the expected format.	One or more of the sections are not in the proper format.	One of the sections is missing.
Writing skills (10 pts)	Excellent sentence structure.  Proofread for content and spelling.  References properly formatted.	Well-constructed sentences.  The report generally uses correct grammar and has only a few errors.  Cited references are missing formatting elements.	Sentences are sometimes awkward, and/or contain run-ons and fragments.  There are enough errors in your paper to distract a reader.  Cited references are not properly formatted.

## Appendix 2 - Rubric for evaluating the research paper.

Report section	Full credit (10 pts)	Partial credit (8 pts)	Minimal credit (6 pts)
Title (10 pts)	Your title is specific, clear and concise. The title contains the subject of the research and the name of the plant used in the study.	Your title is clear, but may not be clear and concise, but does reference the research topic and plant studied.	Your title is not clear and concise and lacks reference to the research topic and plant studied.
Introduction (15pts)	Full credit (15 pts)	Partial credit (12 pts)	Minimal or no credit (6 pts)
	Uses appropriate literature to provide adequate justification and background on the research subject.  Includes an appropriate number of references.  Has a clearly stated objective statement.	Background is not adequately provided.  References are not appropriate to the subject.  Objective statement is not clearly stated.	Background is brief and does not adequately cover the subject.  Less than an appropriate number of references.  Objective statement missing or inadequate.
Materials and Methods (15 pts)	Full credit (15 pts)	Partial credit (12 pts)	Minimal credit (6 pts)
	Includes enough detail and information to be repeated by another researcher.  Describes experiments methods clearly in specific terms.  Describes how and what data was collected.	Details and methods are not clear and specific.  Description of data collection is not complete.	This section does not conform to the format.  Details and methods are minimal.  Description of data collection is lacking.
Results (20 pts)	Full credit (20 pts)	Partial credit (15 pts)	Minimal credit (10 pts)
	Clearly states the results of the collected data.  Results are presented using figures or tables.  Tables or figures have a complete title, legends, x and y axis.  Data presented as means and not repeated in both a table and figure.	Results are not stated clearly.  Results are presented using figures or tables.  Tables or figures do not have a complete title, legends, x and y axis.  Data presented as means and not repeated in both a table and figure.	Results are not stated clearly.  Results are not presented in appropriate figures or tables.  Tables or figures do not have a complete title, legends, x and y axis.  Data is not presented as means or is repeated in both a table and a figure.

Discussion (15 pts)	Full credit (15 pts)	Partial credit (12 pts)	Minimal credit (6 pts)
	<p>Discussion should make conclusions and not just restate results.</p> <p>Use at least 3 references to support discussion.</p> <p>Relates discussion to objectives stated in introduction.</p>	<p>Discussion does not make conclusions and simply restates results.</p> <p>There are at least 3 references, but they do not adequately support the discussion.</p> <p>Discussion does not relate to objectives stated in introduction.</p>	<p>Discussion is brief and does not adequately cover the subject.</p> <p>References not from primary research journals.</p>
Literature cited (15 pts)	Full credit (15 pts)	Partial credit (12 pts)	Minimal credit (6 pts)
	<p>Includes 6-12 references.</p> <p>References are relevant to study.</p> <p>Uses proper journal format.</p>	<p>Includes less than 6 references.</p> <p>References are not generally relevant to study.</p> <p>Uses journal format, but mistakes are present.</p>	<p>Includes less than 6 references.</p> <p>References are not relevant to study.</p> <p>Does not use proper journal format.</p>
<b>Writing competence</b>	Full credit (5 pts)	Partial credit (4 pts)	Minimal credit (3 pts)
Organization (5 pts)	The manuscript follows the required format.	One or more of the sections are not in the proper format.	One of the sections is missing.
Writing skills (5 pts)	<p>Excellent sentence structure.</p> <p>The report has been proofread for content and spelling.</p> <p>References properly formatted in the introduction and discussion.</p>	<p>Well-constructed sentences.</p> <p>The report generally uses correct grammar and has only a few errors.</p> <p>Cited references are missing formatting elements in the introduction and discussion.</p>	<p>Sentences are sometimes awkward, and/or contain run-ons and fragments.</p> <p>There are enough errors in your paper to distract a reader.</p> <p>Cited references are not properly formatted in the introduction and discussion.</p>

## Appendix 3 - Format for Research Paper

A basic journal format is organized into sections titled Introduction; Material and Methods; Results; Discussion; and Literature Cited.

### **Title**

The title should be clear and concise. It should be long enough to clearly tell the reader what the paper is about. The title usually contains the subject of the research and the name of the plant used in the study.

### **Introduction**

In the introduction, you are trying to provide the reader with background information on the subject of your research. This requires a literature search to provide support material for your introduction. You must also justify the need for the proposed research. You are trying to show "why" the research you are conducting is relevant based on the work that has already been published. It should be presented in a logical progression leading to your statement of objectives. The objective statement should be a concise one or two sentences stating what was to be accomplished by the research.

### **Materials and Methods**

The materials and methods section is a concise description of the methods used to conduct the research. It should provide enough information so that another researcher could duplicate your techniques. Use clear, quantitative statements (50°C, 50 seeds; not some seed or high temperature). Include the experimental design, number of replicates and the type of data being collected.

### **Results**

Your results section should summarize the results of your data. Do not interpret your results in this section. Present your data as treatment means (usually not individual data) in a table or a graphical figure. Do not present the same data as both a table and a graph. Choose a format that most clearly illustrates your data. Cite the table or figure in the results section as you summarize your results.

Example: Bean seeds germinated at the highest percentage between 15 and 20°C (Table 1). Seeds germinated at all temperatures but germinated slowest at temperatures above 25°C and below 10°C (Figure 1).

All tables and figures should be labeled and titled concisely. Treatments and the data collected should be identified. All legends should be labeled in detail.

### **Discussion**

In the discussion section, you must evaluate the data collected and try to explain why these were the results. Were the results similar or different from your expectations based on previously published

literature? Remember to use your objectives in this section. How did the results from your experiment meet your objectives? Use the scientific literature to support your assertions in the discussion.

### **Literature Cited**

This section contains the published journal papers you cited in the introduction and discussion sections of your report. Do not include references that are not cited in your report. Always use original research papers where available. Review papers and books are useful references for general items, but cite original research articles from peer-reviewed journals wherever possible.

Citations made in the body of the introduction and discussion sections should include the last name of the author(s) and publication year. Use the Latin phrase *et al.* when there are more than two authors. For example – a single author (Jones, 2004); two authors (Jones and Kester, 2004) and (Jones *et al.*, 2004) for more than two authors.

The references in the literature cited must conform to a uniform format. There are many formats for citations depending on the subject and the audience. Unless a specific target journal has been chosen for your research, follow the format for a manuscript published in one of the journals from the American Society for Horticultural Sciences. The format is listed below:

Reference style for a research report:

Jones, R. O., R. L. Geneve and S. T. Kester. 1994. Micropropagation of gas plant (*Dictamnus albus* L.). *Journal of Environmental Horticulture* 12:216-218.

Reference style for a book chapter:

Geneve, R. L. 1991. Eastern redbud (*Cercis canadensis* L.), Judas tree (*Cercis siliquastrum* L.). p. 142-151. In: Y.P.S. Bajaj (ed.). *Biotechnology in Agriculture and Forestry: Trees III*. Vol. 16. Springer-Verlag, New York.

Reference style for a book:

Hartmann, H.T, D.E. Kester, F.T. Davies, Jr., and R.L. Geneve. 2002. *Hartmann and Kester's Plant Propagation: Principles and Practices*. 7th ed. Prentice Hall, NJ.