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OFFICE OF THE
SENATE COUNCIL**1. General Information**

1a. Submitted by the College of: AGRICULTURE

Date Submitted: 4/29/2013

1b. Department/Division: Plant and Soil Sciences

1c. Contact Person

Name: Hongyan Zhu

Email: hzhu4@uky.edu

Phone: 257-3647

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

1d. Requested Effective Date: Specific Term/Year¹ Spring, 2014

1e. Should this course be a UK Core Course? No

2. Designation and Description of Proposed Course

2a. Will this course also be offered through Distance Learning?: No

2b. Prefix and Number: PLS 615

2c. Full Title: Advanced Plant Genetics and Genomics

2d. Transcript Title:

2e. Cross-listing:

2f. Meeting Patterns

LECTURE: 3

2g. Grading System: Letter (A, B, C, etc.)

2h. Number of credit hours: 3

2i. Is this course repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester?

2j. Course Description for Bulletin: Genomics is reshaping the life sciences, providing high-throughput tools to decipher function of individual genes and to characterize their regulation and interactions. This course will introduce graduate students to most recent advances in the area of plant genetics and genomics. The topics will include structural and functional analysis of plant genomes, genome evolution, application of genomics tools to crop improvement, and basic concepts of bioinformatics.

2k. Prerequisites, if any: Introductory courses in genetics and biochemistry

2l. Supplementary Teaching Component:

3. Will this course taught off campus? No

If YES, enter the off campus address:

4. Frequency of Course Offering: Spring,

Will the course be offered every year?: Yes

If No, explain:

5. Are facilities and personnel necessary for the proposed new course available?: Yes

If No, explain:

6. What enrollment (per section per semester) may reasonably be expected?: 5-10

7. Anticipated Student Demand

Will this course serve students primarily within the degree program?: Yes

Will it be of interest to a significant number of students outside the degree pgm?: Yes

If Yes, explain: [var7InterestExplain]

8. Check the category most applicable to this course: Relatively New – Now Being Widely Established,

If No, explain:

9. Course Relationship to Program(s).

a. Is this course part of a proposed new program?: No

If YES, name the proposed new program:

b. Will this course be a new requirement for ANY program?: No

If YES, list affected programs:

10. Information to be Placed on Syllabus.

a. Is the course 400G or 500?: No

b. The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from 10.a above) are attached: Yes

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1. How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2. How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3. How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4. Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5. How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6. How do course requirements ensure that students make appropriate use of learning resources?

7. Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8. How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (<http://www.uky.edu/UKIT/>)?

9. Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10. Does the syllabus contain all the required components? NO

11. I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

SIGNATURE|TPFEIFFE|T W Pfeiffer|Dept approval for ZCOURSE_NEW PLS 615|20130228

SIGNATURE|LGRABAU|Larry J Grabau|College approval for ZCOURSE_NEW PLS 615|20130228

SIGNATURE|ZNNIKO0|Roshan N Nikou|Graduate Council approval for ZCOURSE_NEW PLS 615|20130403

e

Courses	Request Tracking
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New Course Form

<https://myuk.uky.edu/sap/bc/soap/rfc?services=>

[Open in full window to print or save](#)

Generate F

Attachments:

Upload File

	ID	Attachment
Delete	1649	PLS 615_syllabus.pdf

First 1 Last

Select saved project to retrieve...

Get New

(*denotes required fields)

1. General Information

- a. * Submitted by the College of: AGRICULTURE Today's Date: 4/29/2013
- b. * Department/Division: Plant and Soil Sciences
- c.
 - * Contact Person Name: Hongyan Zhu Email: hzhu4@uky.edu Phone: 257-3647
 - * Responsible Faculty ID (if different from Contact) Email: Phone:
- d. * Requested Effective Date: Semester following approval OR Specific Term/Year ¹ Spring, 2014
- e. Should this course be a UK Core Course? Yes No
 If YES, check the areas that apply:
 - Inquiry - Arts & Creativity Composition & Communications - II
 - Inquiry - Humanities Quantitative Foundations
 - Inquiry - Nat/Math/Phys Sci Statistical Inferential Reasoning
 - Inquiry - Social Sciences U.S. Citizenship, Community, Diversity
 - Composition & Communications - I Global Dynamics

2. Designation and Description of Proposed Course.

- a. * Will this course also be offered through Distance Learning? Yes ⁴ No
- b. * Prefix and Number: PLS 615
- c. * Full Title: Advanced Plant Genetics and Genomics
- d. Transcript Title (if full title is more than 40 characters):
- e. To be Cross-Listed ² with (Prefix and Number):
- f. * Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours³ for each meeting pattern type.

3 Lecture	Laboratory ⁴	Recitation	Discussion
Indep. Study	Clinical	Colloquium	Practicum
Research	Residency	Seminar	Studio
Other If Other, Please explain:			
- g. * Identify a grading system: Letter (A, B, C, etc.) Pass/Fail
- h. * Number of credits: 3
- i. * Is this course repeatable for additional credit? Yes No
 If YES: Maximum number of credit hours:
 If YES: Will this course allow multiple registrations during the same semester? Yes No

j. * Course Description for Bulletin:

Genomics is reshaping the life sciences, providing high-throughput tools to decipher function of individual genes and to characterize their regulation and interactions. This course will introduce graduate students to most recent advances in the area of plant genetics and genomics. The topics will include structural and functional analysis of plant genomes, genome evolution, application of genomics tools to crop improvement, and basic concepts of bioinformatics.

k. Prerequisites, if any:

Introductory courses in genetics and biochemistry

l. Supplementary teaching component, if any: Community-Based Experience Service Learning Both3. * Will this course be taught off campus? Yes No

If YES, enter the off campus address:

4. Frequency of Course Offering.

a. * Course will be offered (check all that apply): Fall Spring Summer Winter

b. * Will the course be offered every year? Yes No

If No, explain:

5. * Are facilities and personnel necessary for the proposed new course available? Yes No

If No, explain:

6. * What enrollment (per section per semester) may reasonably be expected? 5-10

7. Anticipated Student Demand.

a. * Will this course serve students primarily within the degree program? Yes No

b. * Will it be of interest to a significant number of students outside the degree program? Yes No

If YES, explain:

This course has been offered as a special topics course in the past (PLS 597, Special Topics in Plant Genomics). Under that title, it has attracted several graduate students from Plant Pathology and Horticulture.

8. * Check the category most applicable to this course:

- Traditional – Offered in Corresponding Departments at Universities Elsewhere
 Relatively New – Now Being Widely Established
 Not Yet Found in Many (or Any) Other Universities

9. Course Relationship to Program(s).

a. * Is this course part of a proposed new program? Yes No

If YES, name the proposed new program:

b. * Will this course be a new requirement for ANY program? Yes No

If YES, list affected programs:

10. Information to be Placed on Syllabus.

a. * Is the course 400G or 500? Yes No

If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in 10.b. You must include: (i) Ident additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See SR

b. * The syllabus, including course description, student learning outcomes, and grading policies (and 400G-500-level grading differentiation if appl 10.a above) are attached.

- Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.
- The chair of the cross-listing department must sign off on the Signature Routing Log.
- In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, is two hours per week for a semester for one credit hour. (from SR 5.2.1)
- You must also submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.
- In order to change a program, a program change form must also be submitted.

Rev 8/09

[Submit as New Proposal](#) [Save Current Changes](#) [Delete Form Data and Attachments](#)

PLS 615, Advanced Plant Genetics and Genomics

Spring Semester

Course Information

MWF 10:00 – 10:50am

ROOM AGN A6

Instructor Information

Hongyan Zhu

203B KTRDC Building

Tel: 859-257-3647

Email: hzyu4@uky.edu

Office hours: Friday 1.00 – 5.00pm or by appointment

Course Goals

Genomics is reshaping the life sciences, providing high-throughput tools to decipher function of individual genes and to characterize their regulation and interactions. This course will introduce graduate students to most recent advances in the area of plant genetics and genomics. The topics will include structural and functional analysis of plant genomes, genome evolution, application of genomics tools to crop improvement, and basic concepts of bioinformatics.

Student Learning Outcomes

By the end of this course, students will learn strategies for structural and functional analysis of plant genomes, including genome mapping, genome sequencing, genome-wide transcriptional profiling, high throughput forward and reverse genetics, DNA methylation and epigenetics, quantitative trait analysis, and the basic bioinformatics tools.

Prerequisites

Introductory courses in genetics and biochemistry.

Textbook/Readings

No textbook. Readings will be provided for each topic.

Exams and Assignments

Mid-Term Exam 40%

Final Exam 40%

Class Participation 20%

Grading

85-100% A

70-84.9% B

50-69.9% C

<50% E

Policies

Attendance: You are required to attend each lecture unless with excused reasons. 2 percentage points will be deducted from your final grade for each unexcused absence.

Excused Absences and Verification: Please review Student Rights and Responsibilities, Part II, Section 5.2.4.2 (<http://www.uky.edu/StudentAffairs/Code/part2.html>) for UK's policy on excused absences. I will request verification for excused absences.

Makeup Opportunities: If you miss an exam with an excused absence, you will be given an opportunity to make up the missed exam. If an exam is missed for an unexcused absence, no makeup opportunity will be provided.

Academic Accommodations: If you have a documented disability that requires academic accommodations, please see me as soon as possible.

Academic Integrity, Cheating and Plagiarism: See the web page at the Office of Academic Ombud Services for a definition of plagiarism, how to avoid plagiarism, and UK's academic offense policy (<http://www.uky.edu/Ombud/Plagiarism.pdf>). Please refer to Student Rights and Responsibilities, Part II, Section 6.3 (<http://www.uky.edu/StudentAffairs/Code/part2.html>) for UK's policy on academic integrity.

TENTATIVE TOPICS:

Introduction to Genomics
Organization of Prokaryotic and Eukaryotic Genomes
Technical Foundations of Genomics
Basics of Genetic Mapping
DNA Markers for Genetic Mapping
Mapping Quantitative Trait Loci (QTLs)
Map-Based Cloning
DNA Sequencing Methods
Physical Mapping
Strategies and Procedures for Sequencing Entire Genomes
Target Sequencing of Gene-Space
Sequencing of Model and Crop genomes
Gene Finding
BLAST: Basic Local Alignment Search Tools
Multiple Sequence Alignment
Molecular Phylogeny
Dating Duplication Events in Arabidopsis
Comparative Genomics
Genomics of Plant Polyploidy
High-Throughput Genetics I: Forward Genetics

High-Throughput Genetics II: Reverse Genetics

Genomics of Small RNAs

RNA Expression Analysis: Microarrays

Gene Expression Analysis: High-throughput Sequencing

Whole Genome Tiling Arrays: Genome annotation and expression analysis

Whole Genome Tiling Arrays: Genome-wide identification of SNPs

Hapmap and Genome-wide Association Analysis

Epigenomics

Proteomics

Metagenomics

Genomics and Agriculture

Ethical Issues of Genomics