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

1a. Submitted by the College of: ENGINEERING

Date Submitted: 10/2/2013

1b. Department/Division: Computer Science

1c. Contact Person

Name: Nathan Jacobs

Email: jacobs@cs.uky.edu

Phone: 7-5254

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

1d. Requested Effective Date: Semester following approval

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: CS 460g

2c. Full Title: Machine Learning

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:** Study of computational principles and techniques that enable software systems to improve their performance by learning from data. Focus on fundamental algorithms, mathematical models and programming techniques used in Machine Learning. Topics include: different learning settings (such as supervised, unsupervised and reinforcement learning), various learning algorithms (such as decision trees, neural networks, k-NN, boosting, SVM, k-means) and crosscutting issues of generalization, data representation, feature selection, model fitting and optimization. The course covers both theory and practice, including programming and written assignments that utilize concepts covered in lectures.

2k. **Prerequisites, if any:** Strong programming ability (CS 315), basic probability and statistics (STAT 281), and basic concepts of linear algebra (MA/CS 321 or MA/CS 322), or instructor's consent.

2l. **Supplementary Teaching Component:**

3. **Will this course taught off campus?** No

If YES, enter the off campus address:

4. **Frequency of Course Offering:** Fall,

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?:** 20

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: May be of interest to students in Biomedical Informatics and Electrical and Computer Engineering.

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?:** Yes

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|BJSTOK0|Barbara J Brandenburg|CS 460g NEW College Review|20131213

SIGNATURE|ZNNIKO0|Roshan N Nikou|CS 460g NEW Graduate Council Review|20140128

SIGNATURE|JMETT2|Joanie Ett-Mims|CS 460g NEW Undergrad Council Review|20140424

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 R

Attachments:

Upload File

	ID	Attachment
Delete	2344	CS460-Dept-Approval-2013.pdf
Delete	3409	CS_460g_Machine_Learning_Sample_Syllabus_revised.p

1

Select saved project to retrieve...

(\*denotes required fields)

## 1. General Information

- a. \* Submitted by the College of:  Submission Date:
- b. \* Department/Division:
- c.
- \* Contact Person Name:  Email:  Phone:
- \* Responsible Faculty ID (if different from Contact):  Email:  Phone:
- d. \* Requested Effective Date:  Semester following approval OR  Specific Term/Year<sup>1</sup>
- 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<sup>1</sup>  No
- b. \* Prefix and Number:
- c. \* Full Title:
- d. Transcript Title (if full title is more than 40 characters):
- e. To be Cross-Listed<sup>2</sup> with (Prefix and Number):
- f. \* Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours<sup>3</sup> for each meeting pattern type.
- |   |  |                                     |                                     |
|---|--|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> Lecture | <input type="checkbox"/> Laboratory <sup>1</sup> | <input type="checkbox"/> Recitation | <input type="checkbox"/> Discussion |
| <input type="checkbox"/> Indep. Study       | <input type="checkbox"/> Clinical                | <input type="checkbox"/> Colloquium | <input type="checkbox"/> Practicum  |
| <input type="checkbox"/> Research           | <input type="checkbox"/> Residency               | <input type="checkbox"/> Seminar    | <input type="checkbox"/> Studio     |
| <input type="checkbox"/> Other              | If Other, Please explain: <input type="text"/>   |                                     |                                     |
- g. \* Identify a grading system:
- Letter (A, B, C, etc.)
- Pass/Fail
- Medicine Numeric Grade (Non-medical students will receive a letter grade)
- Graduate School Grade Scale
- h. \* Number of credits:
- 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:

Study of computational principles and techniques that enable software systems to improve their performance by learning from data. Focus on fundamental algorithms, mathematical models and programming techniques used in Machine Learning. Topics include: different learning settings (such as supervised, unsupervised and reinforcement learning), various learning algorithms (such as decision trees, neural networks, k-NN, boosting, SVM, k-means) and crosscutting issues of generalization, data representation, feature selection, model fitting and optimization. The course covers both theory and practice, including programming and written assignments that utilize concepts covered in lectures.

## k. Prerequisites, if any:

Strong programming ability (CS 315), basic probability and statistics (STAT 281), and basic concepts of linear algebra (MA/CS 321 or MA/CS 322), or instructor's consent.

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? 20

## 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 pgm?  Yes  No

If YES, explain:

May be of interest to students in Biomedical Informatics and Electrical and Computer Engineering.

## 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 <sup>2</sup> for ANY program?  Yes  No

If YES <sup>2</sup>, 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) identify 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 applicable above) are attached.

<sup>2</sup> Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.  
<sup>3</sup> The chair of the cross-listing department must sign off on the Signature Routing Log.

<sup>22</sup> 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, are two hours per week for a semester for one credit hour. (from SR 5.2.1)

<sup>23</sup> You must also submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.

<sup>24</sup> In order to change a program, a program change form must also be submitted.

Rev 8/09

Submit as New Proposal    Save Current Changes



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September 27, 2013

## MEMORANDUM

TO: Nathan Jacobs  
FROM: Brent Seales *WBS*  
SUBJECT: New Course Proposal CS 460

The new course proposal for CS 460 Machine Learning was vetted by the Computer Science faculty on Monday, 26 August 2013. After discussion by the faculty, the proposal was approved by unanimous vote for submission to the next level in the approval process.