NEW COURSE PROPOSAL

**GRADUATE** Level I (Masters & Phd courses) **X** Level II (Phd courses) **UNDERGRADUATE**

**SCHOOL, DEPARTMENT, COLLEGE**: **Biomedical Engineering** **DATE:** **Nov 30, 2017**

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| 1. Proposed Subject Code & Course Number:   (Verify with Registrar's Office) **BMED 8705** | | | | | | | | | | 2. Hours: *LECTURE* ***3***  *LAB/RECITATION*  ***0***  *SEMESTER CREDIT* ***3***  *Is this course repeatable for credit?*  ***NO\_\_\_*** | | | | | | | | | | | | | | | |
| 3. Descriptive Title: **Machine Learning in Biosciences** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Recommended Abbreviation for Transcript – (24 characters including spaces): | | | | | | | | | | | | | | | | | | | | | | | | | |
| **M** | **A** | **C** | **H** | **I** | **N** | **E** |  | **L** | | **E** | **A** | **R** | **N** | **I** | **N** | **G** |  | |  | **B** | **I** | **O** | **S** | **C** | **I** |
| 5. Catalog Description – (25 words or fewer)  **Introduces machine learning concepts and methods, including supervised and unsupervised learning, dimension reduction and visualization. Topics are accompanied by bioinformatics and systems biology applications.** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. Preferred Grade Basis: L/G P/F Audit  (Note: The default is all grade modes allowed. If this is not preferred for this course, please explain why that is the case.) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. Prerequisites: (**MATH 2401** or **MATH 2411** or **MATH 2605**) AND (**CS 1332** or **CS 1371**)  Prerequisites with concurrency: **None**  Corequisites: **None** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. Has the course been taught as a special topic?  **YES**  If YES, When **Fall 2015, Spring 2017** Enrollment: **12, 16** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Is this course equivalent to another course (graduate or  undergraduate) taught at Ga. Tech? If yes, list course number(s): **NO** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. For undergraduate courses, are you requesting that this course satisfy:   Humanities  Social Science Ethics Global Perspective . | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. Expected Mode of Presentation: | | | | | | | | | *MODE* | | | | | | | | | *% of COURSE* | | | | | | | |
| * Lecture | | | | | | | | | Lecture | | | | | | | | | **80** | | | | | | | |
| Discussion | | | | | | | | | **20** | | | | | | | |
| Seminar | | | | | | | | |  | | | | | | | |
| Demonstration | | | | | | | | |  | | | | | | | |
| Other (Specify) | | | | | | | | |  | | | | | | | |
| * Lab/Recitation | | | | | | | | | Supervised | | | | | | | | |  | | | | | | | |
| Unsupervised | | | | | | | | |  | | | | | | | |
| 12. Planned Frequency of Offering: | | | | | | | | | *TERM TO BE OFFERED* | | | | | | | | | *EXPECTED ENROLLMENT* | | | | | | | |
|  | | | | | | | | | Fall | | | | | | | | |  | | | | | | | |
|  | | | | | | | | | Spring **X** | | | | | | | | | **20** | | | | | | | |
|  | | | | | | | | | Summer | | | | | | | | |  | | | | | | | |
| 1. Probable Instructor(s) – *Please mark with an asterisk any non-tenure track individuals.*   **Peng Qiu, Eva Dyer, May Wang** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Purpose of Course: Relation to other courses, programs and curricula:   **This course aims to provide an introduction to the basic principles and techniques of machine learning, and its applications in biological data analysis. The intended targets are graduate students in Biomedical Engineering, Bioengineering, Bioinformatics, Biology, and related disciplines, and also undergraduate students in their senior year who have completed the prerequisites. The goal is to increase the quantitative training of students in the bio domain, and equip them with computational and machine learning techniques that are increasingly needed and popular in almost all biological studies.** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15. Required Elective **X** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16. Submit a course syllabus | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Please see attached.** | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 17. Can the class count toward degree requirements at Georgia Tech? **YES** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18. Is this class restricted to Free Elective only? **NO** | | | | | | | | | | | | | | | | | | | | | | | | | |

Registrar 2/13