HUDK 4050: Core Methods in Educational Data Mining
Spring 2014
Professor Ryan Baker

SYLLABUS

Instructor Info
Phone: 212-678-8329
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Office: Grace Dodge Hall 464
Office hours: Wednesday 3pm-4pm, or by appointment (appointment preferred)
Course time: Monday and Wednesday, 1pm-2:40pm
Number of points: 3

Required Texts:

- Baker, R.S. (2013) *Big Data and Education.* http://www.columbia.edu/~rsb2162/bigdataeducation.html

Information on how to obtain course readings will be provided in class.

Course Goals: This course covers core methods in educational data mining. Students will learn how to execute these methods in standard software packages, and the limitations of existing implementations of these methods. Equally importantly, students will learn when and why to use these methods. Discussion of how EDM differs from more traditional statistical and psychometric approaches will be a key part of this course; in particular, we will study how many of the same statistical and mathematical approaches are used in different ways in these research communities.

Course Pre-requisites: None, but some prior experience with statistics recommended.

Assignments: No exams or quizzes will be given.

Across the semester, eight basic assignments and six creative assignments will be assigned. The assignments are listed below in the class schedule. Every student must do six of the basic homework assignments (your choice) and four of the creative homework assignments and turn them in by email, ***at least 3 hours before the beginning of class (e.g. noon)*** on the due date. For the basic homework assignments, you must complete 3 of assignments 1-4, and 3 of assignments 5-8. For the creative homework assignments, you must complete 2 of assignments 1-3, and 2 of assignments 4-6. You must do the final creative assignment. You must be prepared to discuss your work in class (you do not need to create slides, but be prepared to have your assignment projected, and to discuss aspects of your assignment in class). Note that assignments are due before the topic is discussed in class; this is intentional. Classroom activities are based on discussion of the challenges of the assignments and subject matter, and the goal of assignments is to drive in-class discussion, rather than serving as an opportunity to practice material already discussed in class.

Since there is a choice of assignments, and discussion of assignments will be a key part of classroom pedagogy, extensions will only be given due to instructor error or extreme circumstances (assignments in other classes, research studies, and so on do not count as extreme circumstances; serious injury,

illness, or death in the family do count as extreme circumstances). Outside of these circumstances, late assignments will not be accepted (e.g. zero credit will be given).

Class participation involves both attendance and active (and constructive) participation in classroom discussions. While it is not expected that you will memorize every paper assigned for the class, it is expected that you will have studied the readings to the degree that you can participate actively in discussions. You are expected to watch the video textbook before class; this will take under an hour a week.

Grading

- 6 of 8 Basic Assignments 6% each (up to a maximum of 36%)
- 4 of 8 Creative Assignments 10% each (up to a maximum of 40%)
- Class participation 24%

BONUS: For every creative assignment, there will be a special bonus of 20% for the best hand-in. "Best" will be defined specifically in each assignment.

Course Schedule and Readings :
See http://www.columbia.edu/~rsb2162/EDM2014/course-schedule-2014.html for the most up-to-date schedule.

UNIVERSITY POLICIES

1. All examinations, papers, and other graded work and assignments are to be completed in conformance with TCs Academic Integrity Policy (http://www.tc.columbia.edu/administration/diversity/index.asp?Id=Civility+Resources+and+Policies&Info=Civility+Resources+and+Policies&Area=Student+Miscon duct+Policy). Students who intentionally submit work either not their own or without clear attribution to the original source, fabricate data or other information, engage in cheating, or misrepresentation of academic records may be subject to charges. Sanctions may include dismissal from the college for violation of the TC principles of academic and professional integrity fundamental to the purpose of the College.

2. The College will make reasonable accommodations for persons with documented disabilities. Students are encouraged to contact the Office of Access and Services for Individuals with Disabilities for information about registration (166 Thorndike Hall). Services are available only to students who are registered and submit appropriate documentation. As your instructor, I am happy to discuss specific needs with you as well.

3. The grade of Incomplete will be assigned only when the course attendance requirement has been met but, for reasons satisfactory to the instructor, the granting of a final grade has been postponed because certain course assignments are outstanding. If the outstanding assignments are completed within one calendar year from the date of the close of term in which the grade of Incomplete was received and a final grade submitted, the final grade will be recorded on the permanent transcript, replacing the grade of Incomplete, with a transcript notation indicating the date that the grade of Incomplete was replaced by a final grade. If the outstanding work is not completed within one calendar year from the date of the close of term in which the grade of Incomplete was received, the grade will remain as a permanent Incomplete on the transcript. In such instances, if the course is a required course or part of an approved program of study, students will be required to re-enroll in the course including repayment of all tuition and fee charges for the new registration and satisfactorily complete all course requirements. If the required course is not offered in subsequent terms, the student should speak with the faculty advisor or Program Coordinator about their options for fulfilling the degree requirement. Doctoral students with six or more credits with grades of Incomplete included on their program of study will not be allowed to sit for the certification exam.

4. Teachers College students have the responsibility for activating the Columbia University Network ID (UNI) and a free TC Gmail account. As official communications from the College – e.g., information on graduation, announcements of closing due to severe storm, flu epidemic, transportation disruption, etc. -- will be sent to the student's TC Gmail account, students are responsible for either reading email there, or, for utilizing the mail forwarding option to forward mail from their account to an email address which they will monitor.

5. It is the policy of Teachers College to respect its members' observance of their major religious holidays. Students should notify instructors at the beginning of the semester about their wishes to observe holidays on days when class sessions are scheduled. Where academic scheduling conflicts prove unavoidable, no student will be penalized for absence due to religious reasons, and alternative means will be sought for satisfying the academic

requirements involved. If a suitable arrangement cannot be worked out between the student and the instructor, students and instructors should consult the appropriate department chair or director. If an additional appeal is needed, it may be taken to the Provost.