ADMT 106401, Elementary Probability
Fall 2015 (4 Credits)

Instructor: Ian Banfield
Office: Maloney 538
Office Hours: Th 5 – 6, TBA.
Schedule: Th 6.15 – 9.15 in Stokes S117

BC email: ian.banfield@bc.edu
Telephone: TBA

Boston College Mission Statement
Strengthened by more than a century and a half of dedication to academic excellence, Boston College commits itself to the highest standards of teaching and research in undergraduate, graduate and professional programs and to the pursuit of a just society through its own accomplishments, the work of its faculty and staff, and the achievements of its graduates. It seeks both to advance its place among the nation’s finest universities and to bring to the company of its distinguished peers and to contemporary society the richness of the Catholic intellectual ideal of a mutually illuminating relationship between religious faith and free intellectual inquiry.

Boston College draws inspiration for its academic societal mission from its distinctive religious tradition. As a Catholic and Jesuit university, it is rooted in a world view that encounters God in all creation and through all human activity, especially in the search for truth in every discipline, in the desire to learn, and in the call to live justly together. In this spirit, the University regards the contribution of different religious traditions and value systems as essential to the fullness of its intellectual life and to the continuous development of its distinctive intellectual heritage.

Course Description
This one semester course studies finite counting problems and the associated calculation of likelihood. Topics include finite sets, permutations and combinations, sample spaces, conditional probability and Bayes’s Theorem, and random variables.

Course Objectives
1. Learn to systematically count objects using basic combinatorial techniques.
2. Develop an understanding of finite probability and basic statistics.
3. Apply these techniques to a diverse range of real world challenges and problems, such as: Critically analyze media reports about drug trials, learning algorithms in artificial intelligence, security of login passwords, quantitative reasoning in business and finance, and others.

Grading
In addition to weekly written and online homework on WebAssign (see Textbook, below), there will be one in-class mid-term examination (50 minutes), one project on applying the material to the “real world”, and one final examination (120 minutes). Both written homework and online homework are assigned weekly. Components are weighed as follows:
Written Homework 12%, Online Homework 12%, Midterm 18%, Project 18%, Final Examination 40%. Students will be expected to participate and contribute to the class through presenting their work and debating relevant material. Students actively participating will receive 5% extra credit towards their final grade for the course.

WCAS Grading System
The undergraduate grading system consists of twelve categories: A (4.00), A- (3.67), excellent; B+ (3.33), B (3.00), B- (2.67), good; C+ (2.33), C (2.00), C- (l.67), satisfactory; D+ (l.33), D (l.00), D- (.67), passing but unsatisfactory; F (.00), failure; l (.00), incomplete; F (.00), course dropped without notifying office; W (.00), official withdrawal from course. The graduate grading system is A (4.00), A- (3.67), Excellent; B+
(3.33), B (3.00), good; B- (2.67), C (2.00), passing but not for degree credit; F (.00), failure.

Grade Reports. All students are required to log into the web through Agora to access their semester grades. Students must utilize their BC username and password to log on. If your username or password is not known the HELP Desk located in the Campus Technology Resource Center (CTRC) in O’Neill Library will issue a new one. The CTRC requires a valid picture ID (a BC ID, driver’s license or passport) to obtain your password.

**Textbook and WebAssign page**

“Finite Mathematics and Its Applications” by Goldstein, Schneider and Siegel, Custom Boston College Edition, available at the Boston College Bookstore. Students will also need access to the course’s WebAssign page (https://www.webassign.net/login.html). Students should enter the class key “bc 4882 5171” when signing up to WebAssign.

**Important Policies**

http://www.bc.edu/content/bc/schools/advstudies/guide/academicinteg.html

**Written Work**

Graduate and undergraduate students are expected to prepare professional, polished written work. Written materials must be typed in the format required by your instructor. Strive for a thorough, yet concise style. Cite literature appropriately, using APA, MLA, CLA format per instructors decision. Develop your thoughts fully, clearly, logically and specifically. Proofread all materials to ensure the use of proper grammar, punctuation, and spelling. You are encouraged to make use of campus resources for refining writing skills as needed [http://www.bc.edu/libraries/help/tutoring.html].

**Scholarship and Academic Integrity**

It is expected that students will produce original work and cite references appropriately. Failure to reference properly is plagiarism. Scholastic dishonesty includes, but is not necessarily limited to, plagiarism, fabrication, facilitating academic dishonesty, cheating on examinations or assignments, and submitting the same paper or substantially similar papers to meet the requirements of more than one course without seeking permission of all instructors concerned. Scholastic misconduct may also involve, but is not necessarily limited to, acts that violate the rights of other students, such as depriving another student of course materials or interfering with another student’s work.

**Request for Accommodations**

If you have a disability and will be requesting accommodations for this course, please register with either Dr. Kathy Duggan (dugganka@bc.edu), Associate Director, Connors Family Learning Center (learning disabilities or AHD) or Dean Paulette Durrett, (paullette.durrett@bc.edu), Assistant Dean for students with disabilities, (all other disabilities). Advance notice and appropriate documentation are required for accommodations. For further information, you can locate the disability resources on the web at http://www.bc.edu/content/bc/libraries/help/tutoring/specialservices.html.

**Attendance**

Class attendance is an important component of learning. Students are expected to attend all classes and to arrive by the beginning of and remain for the entire class period. When an occasion occurs that prevents a student from attending class, it is the student’s obligation to inform the instructor of the conflict before the class meets. The student is still expected to meet all assignment deadlines. If a
student knows that he or she will be absent on a particular day, the student is responsible for seeing the instructor beforehand to obtain the assignments for that day. If a student misses a class, he or she is responsible for making up the work by obtaining a classmate's notes and handouts and turning in any assignments due. Furthermore, many instructors give points for participation in class. If you miss class, you cannot make up participation points associated with that class. Types of absences that are not typically excused include weddings, showers, vacations, birthday parties, graduations, etc. Additional assignments, penalties and correctives are at the discretion of the instructor. If circumstances necessitate excessive absence from class, the student should consider withdrawing from the class. In all cases, students are expected to accept the decision of the instructor regarding attendance policies specific to the class.

Consistent with our commitment of creating an academic community that is respectful of and welcoming to persons of differing backgrounds, we believe that every reasonable effort should be made to allow members of the university community to observe their religious holidays without jeopardizing the fulfillment of their academic obligations. It is the responsibility of students to review course syllabi as soon as they are distributed and to consult the faculty member promptly regarding any possible conflicts with observed religious holidays. If asked, the student should provide accurate information about the obligations entailed in the observance of that particular holiday. However, it is the responsibility of the student to complete any and all class requirements for days that are missed due to conflicts due to religious holidays.

There may be circumstances that necessitate a departure from this policy. Feel free to contact the WCAS at 617-552-3900 for consultation.

**Deadlines**
The online homework will be due Monday midnight following the lecture, and the written homework will be due at the start of the lecture. The project will be due 11/12/2015. Students may submit up to two written assignments late. If a written assignment is submitted late, 20% will be subtracted for each day the assignment is late. If a written assignment is more than 5 days late, or if a student has already submitted two or more assignments late, no credit will be given for the assignment. No credit will be given for late online homework.

**Course Assignments**
It is expected that 8 hours per week of your study time out will be spent on out of class assignments and exercises. These are listed below. Please note that some weeks will require more time and some weeks less time but the average is approximately 8 hours per week over the semester. All written assignments and the project will be posted on the course’s Canvas page, all online assignments will be posted on the WebAssign page.

(see overleaf)
Schedule

The following is a provisional schedule of the sections we will cover on each of the class days. An up-to-date log of classes and expected reading for the next class will be kept on the course’s Canvas page.

9/3: Sections 5.1, 5.2, 5.3: Sets, Venn Diagrams, Counting.
9/10: Sections 5.4, 5.5: Multiplication Principle, Permutations, Combinations.
9/17: Sections 5.6, 5.7: Further Counting Techniques, Binomial Theorem.
9/24: Sections 5.8: Multinomial Coefficients, Partitions. Review.
10/1: Midterm 1.
10/22: Sections 6.5, 6.6: Tree Diagrams, Bayes’ Theorem.
10/29: A little excursion into artificial intelligence.
11/5: Sections 7.1, 7.2: Representing Data, Distributions.
11/12: Project is due. Sections 7.3: Binomial Trials
11/19: Sections 7.4, 7.5: Mean and Variance
12/3: Sections 7.6, 7.7: The Normal Distribution, A Central Limit Theorem
12/10: Review
12/17: Final Examination.