MATH100501, Excursions in Advanced Mathematics
Summer, 2015  Credits: 03

Instructor: Chi-Keung Cheung  email: cheungc@bc.edu
Office: Carney 369  
Office Hours:  M W 11 - 12:30, Th 12 - 1
Schedule (class times and day(s):  MTWT 9 - 11

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
In this course, we will explore several areas of advanced mathematics through lectures, classroom discussions, and labs. These include topics such as topology, transformation geometry, computational geometry, chaos, and coding, which are not normally taught in the high school curriculum. Through studying these exciting developments in modern mathematics, students can further develop their critical thinking and problem-solving skills. A good background in high school algebra and geometry is recommended.

Course Objectives
1. Students can develop better mathematical writing skills and problem solving technique.
2. This program provides the environment and supports enabling students to develop advanced quantitative reasoning skills.
3. Demonstrate an appreciation of advanced mathematics applied across cultural settings and learn the impact of culture, gender, and age in mathematics as demonstrated by examples used in class.
4. Demonstrate ethical appreciation of the importance of academic integrity pertaining to mastery of mathematics as demonstrated by completing their work responsibly.

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>HOMEWORK</td>
<td>35%</td>
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<tr>
<td>CLASSWORK</td>
<td>15%</td>
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<tr>
<td>MID-TERM</td>
<td>15%</td>
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<tr>
<td>FINAL EXAM</td>
<td>25%</td>
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<td>PROJECT</td>
<td>10%</td>
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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- (1.67), satisfactory; D+ (1.33), D (1.00), D- (.67), passing but unsatisfactory; F (.00), failure; I (.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.

**Text(s)/Readings (Required)**
Course lecture notes will be provided

**Text(s)/Readings (Recommended)**
Supplementary reading list will be provided in class

**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 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**
Homework Assignments are due at the beginning of the class period on Thursday.
No late homework will be accepted.
Classwork Assignments/Lab reports are due at the end of that class period.
Project is due on Friday July 31.

**Course Assignments** (readings, exercises and/or experiences)
- The lectures meet for 6 hours per week.
  - Besides the lecture time, students will also meet with math graduate students in small section during discussion section or lab section for 2 hours per week
  - Students are expected to spend 8 hours per week of the study time on the class assignments, exercises and project.

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<tr>
<th>Date</th>
<th>Topic</th>
<th>Exercises/Experiences</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>6/22 - 6/25</td>
<td>Topology</td>
<td>HW 1</td>
<td>6/25</td>
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<tr>
<td>6/29 - 7/2</td>
<td>Topology,</td>
<td>HW 2</td>
<td>7/2</td>
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<td>7/6 - 7/9</td>
<td>Transformation Geometry</td>
<td>HW3, Mid-Term</td>
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<td>7/13 - 7/16</td>
<td>Computational Geometry</td>
<td>HW 4</td>
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<td>7/20 - 7/23</td>
<td>Coding</td>
<td>HW 5</td>
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<td>7/27 - 7/30</td>
<td>Chaos</td>
<td>HW 6, Final, Project</td>
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