

## GEN025 N1 数学の世界 World of Mathematics

### Schedule

DATE	TITLE	NOTE
April 12	1. 導入 (Introduction) このコースについて	数学学力調査 (Research Test)
April 15	2. 集合と論理 (Sets and Logic)	
April 17	3. 集合と論理 (Sets and Logic)	
April 19	4. 集合と論理まとめ (Summary)	Quiz 1 : 集合・論理
April 22	5. 1対1対応 (One-to-one Correspondence)	
April 24	6. 1対1対応 (One-to-one Correspondence)	
April 26	7. 1対1対応まとめ (Summary)	Quiz 2 : 1対1対応
April 29	8. 数学的帰納法 (Mathematical Induction)	
May 1	9. 数学的帰納法 (Mathematical Induction)	
May 3 & 6	No Class	<i>National Holidays</i>
May 8	10. 数学的帰納法まとめ (Summary)	Quiz 3 : 数学的帰納法
May 10	11. 鳩ノ巣原理 (Pigeon-Hole Principle)	
May 13	12. 鳩ノ巣原理 (Pigeon-Hole Principle)	
May 15	13. 鳩ノ巣原理まとめ (Summary)	Quiz 4 : 鳩ノ巣原理
May 17	No Class	<i>New Student Retreat</i>
May 20	14. グラフ・偶奇性 (Graphs: Even and Odd)	
May 22	15. グラフ・偶奇性 (Graphs: Even and Odd)	
May 24	16. グラフ・偶奇性まとめ (Summary)	Quiz 5 : グラフ・偶奇性
May 27	17. 最適化問題 (Optimization)	
May 29	18. 最適化問題 (Optimization)	
May 31	19. 最適化問題まとめ (Summary)	Quiz 6 : 最適化問題
June 3	20. オイラーグラフ (Euler Graphs)	
June 5	21. ハミルトングラフ (Hamilton Graphs)	
June 7	22. オイラー・ハミルトンまとめ (Summary)	Quiz 7 : オイラー・ハミルトン
June 10	23. 平面的グラフ (Planar Graphs)	
June 12	24. 平面的グラフ (Planar Graphs)	
June 14	25. 平面的グラフまとめ (Summary)	Quiz 8 : 平面的グラフ
June 17	26. まとめ (Review for Final)	Old Final Problems

### Course Objectives

Activate your brain and get training for Mathematical thinking, and have a chance to polish your logical explanation skill. Explain to your friends or family members what you understand.

### Important Information

1. Final will be given during the term exam week.
2. Extra office hour for the final exam will be announced at the last class.
3. World of Mathematics Home Page (basic information and messages on topics):  
<http://subsite.icu.ac.jp/people/hsuzuki/science/class/ns1a/>
4. Moodle (for other information): Follow the link from Portal. Key: GEN025WM2013S

5. Math Helpdesk: Science Hall S302 (1:00 p.m. – 4:20 p.m., M., Tu. & W.)
6. Office Hour: 3/W, 3/F, 10:10 a.m. - 11:20 p.m. or by appointment. (Science Hall S309)
7. Email: [hsuzuki@icu.ac.jp](mailto:hsuzuki@icu.ac.jp) Office Phone: 0422-33-3292

## Grading Policy

1. Quiz (小テスト): total of 95 pts. 8 quizzes (10 pts each) are scheduled. 2 extra pts will be given for each quiz attendance (maximum 15 in total). Submit or re-submit a quiz by the next quiz or the final for the last quiz if you are absent or your score is less than 4 pts, and 40 percents of the score of it will be recorded for the quiz. You can find quizzes and their solutions in Moodle. Late submission will be accepted if there is a special excuse.
2. Short Paper (レポート課題): 15 pts. See below.
3. Final Exam: 90 pts.
4. Total: 200 pts. Grade A is guaranteed if 180 pts or more, and Grade A, B or C if 100 pts or more. Expected course GPA would be in between 2.5 and 2.7. See URL [http://subsite.icu.ac.jp/people/hsuzuki/science/class/ns1a/ns1a\\_grade.html](http://subsite.icu.ac.jp/people/hsuzuki/science/class/ns1a/ns1a_grade.html)

## Paper

1. Choose a topic A or B below. Maximum of 2 pages (A4 size paper). Please use one side only and a paper clip (no stapling), as I scan your paper.
2. Due: 7:00 p.m. May 22. Deposit in the report submission box at H113.
3. Give title: up to 32 characters in alphabets or digits, or 16 characters in Japanese.
4. Topics: A. Mathematics in daily life. A brief explanation of Mathematics used should be included. 身近なところに現れる・使われている数学について、数学の内容についてもこのクラスの受講生にわかるように説明すること。  
B. Discussion on an article from a newspaper with excellent logic or flaws in logic. 新聞の記事 (Japanese or English) で論理に問題がある、または論理展開が秀逸なものの例とその論理に関する考察。
5. To be publicized in Moodle. Among 15 pts, 5 pts are for basic requirements, and the remaining 10 pts will be decided by class voting. The title of the paper is important in order to attract other students to read your paper to get a vote.
7. Examples: Guest Login: <http://olcs.icu.ac.jp/moodle/course/view.php?id=969>

## Tea Time

**Black and White Cats (黒猫と白猫)** 3人 (梨奈、加奈、春奈) のうち2人は黒猫を飼っています。また2人は白猫を飼っています。黒猫も白猫も飼っていない人はいません。黒猫を飼っている人は必ずウソをつきますが、黒猫を飼っていない人が真実をのべるとは限りません。There are three, i.e., Haruna, Kana and Rina. Two have white cats and two have black cats. All have either white cats or black cats or both. Whoever has black cats always tells a lie. (Otherwise they may tell a lie or a truth.)

梨奈「加奈は白猫を飼っています」加奈「春奈は白猫を飼っています」

Rina says Kana has white cats, and Kana says Haruna has white cats.

さて、だれが何を飼っているのでしょうか？ Who has which?

(小野田博一著「史上最強の論理パズル」より)

鈴木寛 Hiroshi Suzuki (Office: Science Hall S309)