

DE LA SALLE UNIVERSITY MANILA  
COLLEGE OF SCIENCE  
Mathematics Department

**SYLLABUS**

COURSE CODE	MTH665M/D
COURSE TITLE	Combinatorics of Finite Geometries
CLASS DAY & TIME	
ROOM	
NAME OF FACULTY	
COURSE CREDIT	3 units
CONTACT NO. (DEPT)	(02) 536-0270, (02) 524-4611 loc. 420/413
TERM/SCHOOL YEAR	

**COURSE DESCRIPTION**

Combinatorial Geometry is an introduction to the study of Finite Geometry using combinatorial techniques. It lays the basic foundation for 'classical' synthetic geometry with the inclusion of topics such as near linear spaces, linear spaces, projective spaces and affine spaces.

Topic	Learning Strategy, Activity	See Meeting for
<p><b>LINEAR SPACES</b></p> <ol style="list-style-type: none"> <li>1. Definition and examples</li> <li>2. New near-linear spaces from old</li> <li>3. Subspace</li> <li>4. Basis and dimension</li> <li>5. Some properties of finite near-linear spaces</li> <li>6. Isomorphism</li> </ol>	<p>Lecture-Discussions Problem Solving</p>	<p>Weeks 1-3</p>
<p><b>LINEAR SPACES</b></p> <ol style="list-style-type: none"> <li>1. Definition and examples</li> <li>2. The exchange property</li> <li>3. An inequality</li> <li>4. The case of equality</li> </ol>	<p>Lecture-Discussions Problem Solving</p>	<p>Weeks 4-7</p>

**FINAL EXAMINATION**

Week 8

- **Midterm Exam**. The midterm exam is a sit-in, three-hour examination with a total of 100 points.
- **Final Exam**. The final exam is a comprehensive, sit-in, three-hour examination with a total of 100 points.

**ASSESSMENT EVALUATION**

The computation of the final grade will be based on the following: problem sets 1/3, midterm exam 1/3, and final exam 1/3. A master student must get a minimum of 60% (or 2.0) to get graduate credit for the course. A doctoral student must get at least 70% (or 2.5) for graduate credit.

**EXERCISES**

- Batten, Lynn Margaret, *Combinatorics of Permutations* Second Edition, Cambridge University Press, Cambridge 1997.

**REFERENCES**

- Gallian, Joseph, *Combinatorics* 4<sup>th</sup> ed Houghton Mifflin Co., USA 1998.
- Hughes, D.R and Piper, F.C. *Procedural Algebra* Springer-Verlag., New York 1973.
- Lam, C.W.H., Kolesova., G. and Thiel, L., *A combinatorial proof for the number of permutations of order  $n$  with  $m$  cycles* (1991) 187 – 195.
- Lam, C.W. H. Thiel. L., and Swiercz, S., *The non-existence of permutations of order  $n$* , Canadian Journal of Mathematics 41 (1989) no. 6, 1117 – 1123.
- Lang, Serge, *Algebra* 3<sup>rd</sup> ed., Addison – Wesley Publishing Co. USA 1993.
- Room, T.G. and Kirkpatrick, P.B. *Modern Elementary Number Theory and the Theory of Permutations* Cambridge University Press, Cambridge 1971.
- Snaith, Victor P. *Group Theory and Combinatorics* World Scientific Publishing Co. Singapore 1998.

Noted by:



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