

# MATH COLLOQUIUM SERIES

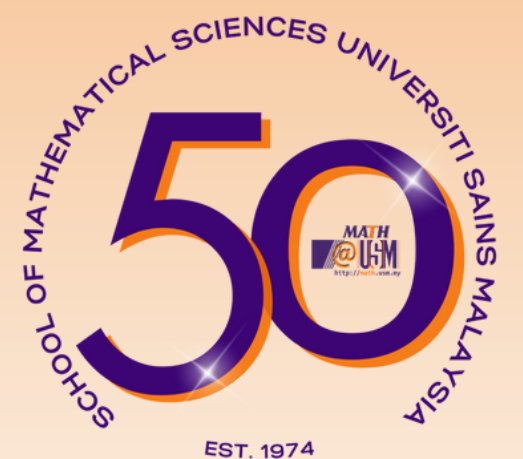


SCHOOL OF MATHEMATICAL SCIENCES  
UNIVERSITI SAINS MALAYSIA



**PROF. NADER JAFARI RAD**

DEPARTMENT OF MATHEMATICS AND  
COMPUTER SCIENCE,  
SHAHED UNIVERSITY, TEHRAN, IRAN



## PROBABILISTIC METHODS IN COMBINATORICS

The probabilistic method is a powerful tool in combinatorics, graph theory, number theory, and combinatorial geometry. It involves proving facts by designing and manipulating certain random experiments, whose outcomes have properties that would be difficult to guarantee otherwise. We present several techniques, including counting techniques, linearity of expectation, alternation, and the Lovasz Local Lemma. We prove several results for graphs and hypergraphs, including Ramsey numbers, hypergraph coloring, dominating sets, independent sets, Hamiltonian paths, splitting graphs, packing numbers, alliance numbers, and more, and present some recent developments in these areas. Finally, we study several asymptotic results for graph properties in random graphs.

 **LIVE** • matematikUSM

**Part 1**  
Thursday, 30 May 2024

**Part 2**  
Thursday, 6 June 2024

Time: 3:00 – 4:00 pm

MS Teams link: <https://bit.ly/MCS0506-24>

Website: <http://math.usm.my>  
Email: [dean\\_mat@usm.my](mailto:dean_mat@usm.my)  
Tel: +604 653 3284 | Fax: +604 657 0910  
Facebook: <https://www.facebook.com/matematikUSM>  
Instagram: [https://www.instagram.com/math\\_usm](https://www.instagram.com/math_usm)



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