

The syllabus of Graph Theory and Network

课程基本信息 (Course Information)					
课程代码 (Course Code)	MA336	学时 (Credit Hours)	64	学分 (Credits)	4
课程名称 (Course Name)	图论与网络 Graph Theory and Network				
课程属性 (Course Type)	专业必修课				
开课院系 (School)	Zhiyuan College	开课学期 (Term)	Spring		
先修课程 (Prerequisite course)					
授课教师 (Instructors)	Eiichi Bannai				
课程简介 (Description) 300-500 字	<p>Introduction to graph theory and to network theory. We start with the introduction to general graph theory, and in addition we discuss algebraic graph theory. We will also discuss the introduction to the network theory from the view point of graph theory. We put an emphasis on how linear algebraic technique is applied for the study of graphs and networks.</p>				
课程教学大纲 (course syllabus)					
*学习目标(Learning Outcomes)	<p>After completing the course, students should:</p> <ol style="list-style-type: none"> 1. Definitions and Examples of Graphs and Digraphs\\ 2. Paths and Cycles: Connectivity of graphs, Eulerian and Hamiltonian graphs\\ 3. Trees: Fundamental properties of trees and spanning trees\\ 4. Cycles and Cuts\\ 5. Adjacency matrix of a graph and spectrum of a graph\\ 6. Laplacian of a graph\\ 7. Matrix-Tree Theorem\\ 8. More on algebraic graph theory (strongly regular graphs and related topics)\\ 9. Planarity of Graphs\\ 10. Coloring of Graphs\\ 11. Flows in Networks\\ 12. Matchings and Hall's Marriage Theorem\\ 13. Network Flows and Mini-Max Theorem\\ 14. Menger's Theorem\\ 15. Electric Networks\\ 16. Linear Algebraic Method to study Networks\\ 17. Group Theory and graph theory\\ 				

	<p>Learning outcomes:</p> <ol style="list-style-type: none"> 1. to get familiar with the concepts of graphs and networks, and learn fundamental results. 2. to understand how linear algebra is useful in the study of graphs and networks. 					
<p>*教学内容、进度安排及要求 (Class Schedule & Requirements)</p>	<p>教学内容 topics</p>	<p>学时 Credit hours</p>	<p>教学方式 Teaching methodology</p>	<p>作业及要求 tasks</p>	<p>基本要求 Intended learning outcomes</p>	<p>考查方式 Assessment methods</p>
	<p>graphs and networks</p>	<p>4</p>	<p>lectures</p>	<p>Some homeworks will be assigned</p>	<p>to know the introduction to graph theory and network theory</p>	<p>one midterm exam and the final exam</p>
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<p>考核方式 (Assessment methods and Grading)</p>	<p>The course grade will be decided (mostly) base on the results of the midterm exam and the final exam</p>					

<p>教材或参考资料 (Textbooks & Other Reading Materials)</p>	<p>There are many books on this subject. I will not use a single text book. As a reference book for the introductory part, I recommend the book "Introduction to Graph Theory (5th edition)" by Robin Wilson, Person Education Limited 2010. Further reference books will be used for the algebraic graph theory part and for the network part. (These books will be mentioned during the lectures.)</p>
<p>备注 (Notes)</p>	