

朝陽科技大學 093學年度第2學期教學大綱  
Natural Ventilation Design for Buildings 自然通風設計

當期課號	4013	Course Number	4013
授課教師	邱英浩	Instructor	CHIU, YIN HAO
中文課名	自然通風設計	Course Name	Natural Ventilation Design for Buildings
開課單位	建築系(二日)三A	Department	
修習別	選修	Required/Elective	Elective
學分數	2	Credits	2
課程目標	<p>此課程所教授之內容及原則將教育建築系學生能夠達成以下所列目標：            (1) 予建築設計初期階段能有效的考慮自然通風設計，例如：建築物之配置及形體之考量。(2) 廣泛了解各種建築自然通風之技術及可行策略。(3) 藉課程培養與暖通設計工程師及業主從事有效之交流能力。以上之目標可藉由自然通風之定性分析方法及物理現象描述達成，但許多建築師仍希望能更深入的以定量方法分析，即使建築師並無相關之高深技術背景；這仍是可能達到的，這便是此此課程之第四個目標，針對數種常見之建築種類進行定量計算分析。</p>	Objectives	<p>To provide information and guidance that will enable architectural students</p> <p>(i) To make informed decisions about the design of naturally ventilated buildings, particularly at the outline stage of a project (e.g. when basic decisions are made about the form and layout of a building)</p> <p>(ii) To understand in a qualitative way the many technical issues raised by natural ventilation and the solutions that are available to the design engineer</p> <p>(iii) to engage in an informed dialogue with design engineers and with clients</p> <p>The above aims can be met by providing qualitative and physical descriptions of natural ventilation phenomena. However, some Architects may wish to proceed further and be involved in quantitative procedures. In many cases this does not require a highly technical background. Thus, the fourth aim is to enable them</p> <p>(iv) to carry out simple quantitative calculations that are often sufficient for certain types of building.</p>
教材	<ol style="list-style-type: none"> <li>1. Chiu, Y-H (邱英浩) and Etheridge, DW, Ventilation lecture handout, Nottingham. Unpublished.</li> <li>2. Chiu, Y-H (邱英浩) and Etheridge DW Experimental technique to determine unsteady flow in natural ventilation stack at model scale. Journal of wind engineering and industrial aerodynamics, 92(2004) 291-313.</li> <li>3. Chiu, Y-H (邱英浩) Development of unsteady design procedures for natural ventilation stacks, PhD thesis, The University of Nottingham, 2004.</li> <li>4. Etheridge, DW and Sanderg, M Building ventilation theory and measurement, John Wiley &amp; Sons, Chichester, UK, 1996.</li> <li>5. Ventilation lecture handout, Welsh School of Arch, Cardiff University. Unpublished.</li> <li>6. Natural ventilation in non-domestic buildings application manual AM10, CIBSE, UK, 1997.</li> <li>7. Environmental design guide A, CIBSE, UK, 1999.</li> <li>8. Awbi, HB ventilation of buildings, Spon press, London, 2003.</li> </ol>	Teaching Materials	
	分組書面學術或設計報告50%，口頭		Group essay 50%, Presentation 30%,

成績評量方式	學術報告30%, 課堂表現與出席率20%.	<b>Grading</b>	Participation and attendance 20%.
教師網頁	-		
教學內容	<p>此課程將以下列提出之單元分別介紹並配合專題指導方式進行</p> <ol style="list-style-type: none"> <li>1. 通風理論</li> <li>2. 設計標準及策略</li> <li>3. 空氣滲漏理論及實驗</li> <li>4. 設計及計算工具</li> <li>5. 風動實驗介紹</li> <li>6. 計算流體力學介紹(電腦模擬)</li> <li>7. 通風及能源</li> <li>8. 案例分析</li> </ol>	<b>Syllabus</b>	<p>The lecture is divided into several topics given below and carried out by the supervision of the course lecturer to the students who have to submit an essay at the end of the course.</p> <ol style="list-style-type: none"> <li>1. Ventilation principle and theory</li> <li>2. Design criteria and strategies</li> <li>3. Air leakage theory and measurement</li> <li>4. Design tools</li> <li>5. Introduction of wind tunnel measurement</li> <li>6. Introduction of CFD (Computational Fluid Dynamics)</li> <li>7. Ventilation and energy impact</li> <li>8. Case study</li> </ol>

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