

30 May 2014

The Berkeley Prize Committee  
2014 Teaching Fellowship Jurors  
info@berkeleyprize.org

Dear Berkeley Prize Committee,

**Re: 2014 Teaching Fellowship Application**

It is my pleasure to submit my application to the prestigious Berkeley Prize Teaching Fellowship 2014.

I am an Assistant Professor in the Division of Building Science and Technology at the City University of Hong Kong, and have been engaged in architectural education for over 15 years.

Hong Kong is a city renowned for its high-density living environment and rapid developments, especially in the ever-expanding urban areas. But behind the glitter of the towering new residential skyscrapers there remain social problems brought about by the redevelopment of older neighbourhoods. Furthermore, street-level activities and spaces are often neglected in the vast scales of these new developments. I am delighted to have the opportunity to couple my design studio on urban interventions with the research-based architectural spatial analysis course to combine rigorous investigation with design innovation to explore solutions for *healthful vertical architecture*.

I look forward to contributing to architectural education through the Berkeley Prize Teaching Fellowship.

Yours truly,

A handwritten signature in black ink, appearing to read 'JFW', followed by a long horizontal flourish and a period.

Dr Joseph Francis Wong  
Associate Programme Leader, Bachelor of Science in Architectural Studies  
Assistant Professor  
Division of Building Science and Technology  
The City University of Hong Kong

## Berkeley Prize 2014 Teaching Fellowship Application

### Applicant's Credentials

Assistant Professor Dr Joseph Francis Wong joined CityU in 1998 and has taught design studios and subject area courses at various levels. He was instrumental in designing and implementing the Problem-based Learning (PBL) curriculum for the Associate of Science in Architectural Studies program (AScAS) and establishing the Bachelor of Science in Architectural Studies (BSAS) program at the university. The innovative learning-based PBL AScAS curriculum integrates all subject area courses horizontally with the design studio and emphasizes application of acquired knowledge. The PBL setting formed the base of his Doctorate of Education dissertation on collaborative learning.

His devotion to promoting learning has led to a number of education grants from both inside and outside the university, most notably a HK\$500,000 (US\$64,500) CityU Idea Incubator Grant to enhance the learning environment for design students and another HK\$500,000 grant from the Hong Kong government's Art Promotion Office to develop and produce artworks together with students for display in public parks for ArtAlive@Park 2012.

Dr Wong currently coordinates the BSAS Year 4 studio Urban Interventions where he explores with students *spatial genotypes*, and the Year4 Final Year Project, a research based undergraduate dissertation that runs parallel with the design studios. Besides studios, Dr Wong teaches two BSAS courses – Theory in Architectural and Urban Design, and Architectural Spatial Analysis. He was the AScAS Program Leader before becoming the BSAS Associate Program Leader in 2012.

Dr Wong's research interests are in spatial analysis and open building (flexible mass housing). His research has been presented and published in many conferences and journals, including Design Studies, Habitat International, Journal of Architecture, and Environment and Planning B. He is always keen to extend his research into studio teaching and encourages students to approach design in a more rigorous and analytical manner so as to form a stronger foundation for theoretical explorations. This rigor will form a key feature of the fellowship program if selected. In particular, he would lead students in the Year 4 Fall design studio to explore design possibilities in ultra-high-density mass housing environments to promote *healthful architecture* within the setting of Hong Kong, by far the city with the highest concentration of residential skyscrapers. These proposals will then be analysed in more detail in the Spring Architectural Spatial Analysis using space syntax and social network analysis tools to develop a typology of solutions for *healthful vertical architecture*.

Dr Wong also has vast experience as organiser and facilitator for community engagement exercises. He has conducted participatory design workshops for the Hong Kong Housing Authority, including as Project Leader of a HK\$680,000 public engagement exercise for the design of public housing estate open spaces, as well as for HKIA and other organizations.

Professionally, Dr Wong actively serves the Hong Kong Institute of Architects, where he became a Full Member in 1996. He has served on various boards and committees, including the Board of Internal Affairs, Board of Education Affairs, and the Environment and Sustainable Design Committee (Chairman 2007-08). He was a Council Member of the Hong Kong Green Building Council and currently a Hong Kong Green Council Green Label Scheme Advisory Panel member.

Dr Wong received his Bachelor Arts (Architecture) from Berkeley in 1991 and his Master of Architecture from MIT in 1993. He completed his EdD at Leicester in 2011.

## Healthful Vertical Architecture: Re-permeating Ultra-high Density Living Environment

Emblematic of Koolhaas' (2002) concept of *junkspace*, the ubiquitous massive podiums of shopping malls and car parks dominate the urban fabric of Hong Kong (Figure 1). These unending expanses of interior spaces "promote[ ] disorientation by any means" (p.175). Like candles sitting on a birthday cake, the residential towers and their inhabitants above are disconnected from the urban fabric, killing off any possibility of a vibrant street-scape. Extending 40 floors or more with eight apartments per floor, a typical 5-tower development is a *vertical city* that houses over 5,000 people up to 20-30 meters (66 to 100 feet) above street level.



### Permeable Elements

Provision of permeable elements within, above, below or between buildings

- clear opening size of such a permeable element is not less than 3m

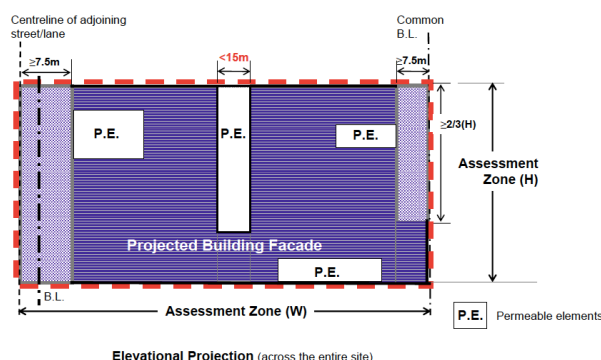


Figure 1 (Left): A typical podium-type development with 11 residential towers sitting on a 7-storey carpark. (Source: Wikipedia user / Baycrest. License: CC-BY-SA-2.5). Figure 2 (Right): Diagram explaining the permeability of buildings requirements. (Source: Hong Kong Buildings Department.)

Besides the displacement from street life, these extensive impenetrable podiums obstruct much air circulation into the dense city, further adding to the problem of *urban heat island* (UHI) effect in Hong Kong, where increases of up to 10°C (18°F) in urban areas compared to suburban areas is not uncommon<sup>1</sup>. The Hong Kong Buildings Department introduced a new set of Sustainable Building Design Guidelines in 2011 to counter this problem and stipulated a minimum permeability of buildings for new developments to facilitate air movement in dense urban areas<sup>2</sup>. However, the outcome is mostly limited to two-dimensional geometric considerations of the physical massing (Figure 2). Moreover, this new statutory requirement has re-opened the podium previous dominated by commercialism and economics for re-examination based on social, environmental and health considerations. While others see the permeability requirements as additional constraints on the design of high-rise residential developments, this proposal sees this as ***an opportunity to re-inhabit the lower zones of a building and inject much-needed life back to the spaces near the street.***

The objective of this proposal is two-fold:

1. **Exploration of the permeated three-dimensional form as an enhancement of social interaction and health conditions of the living environment** (to be addressed in design studio *SE4001 Architectural Design 6: Urban Interventions*), and
2. **Establishing desirable attributes for healthful vertical architecture through spatial analysis of the resulting design schemes and community engagement workshops** (to be addressed in elective course *SE3001 Architectural Spatial Analysis*).

<sup>1</sup> Green Power Hong Kong (2012). *Report on Urban Heat Island Effect in Hong Kong*. Available from: <[http://www.greenpower.org.hk/html/download/concern/gp\\_urban\\_heat\\_island\\_report\\_2012.pdf](http://www.greenpower.org.hk/html/download/concern/gp_urban_heat_island_report_2012.pdf)>. [28 May 2014].

<sup>2</sup> Hong Kong Buildings Department (2011). *Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers APP-152: Sustainable Building Design Guidelines*. Available from: <<http://www.bd.gov.hk/english/documents/pnap/APP/APP152.pdf>>. [28 May 2014].

## The Project – Healthful Ultra-High Density Vertical City

### Part 1: Design Studio SE4001 Architectural Design 6: Urban Interventions (BSAS Year 4 / 40 students)

Redevelopments of old urban districts in Hong Kong are often perceived as a disruption to the local community and result in displacement of current residents. This studio project aims to change this perception through rigorous design and focuses on a city block in the Yaumatei district on Kowloon peninsula where dilapidated tenement type blocks with limited services and facilities stand. Despite the rundown state of the built environment, it is home to a vibrant community of mom-and-pop shops, markets, Chinese medicine practitioners, local food stalls, etc, that have grown into an integral part of the lives of the mostly under-privileged families in the vicinity. The studio project examines the possibilities of regenerating the community by rebuilding a better environment to house these local features and extend this vibrant fabric upwards to connect with the new living environment to form a healthful vertical city.

Using the parameters set out in the new Sustainable Building Design Guidelines as a base, in particular those requirements on permeability of buildings, the studio explores strategies for controlling **density**, **porosity** and **proximity** to reinterpret the ultra-high density mass housing block as a vertical extension of the city's fabric and activities:

DENSITY: disposition and optimization (of area) of existing and new programs to foster a vibrant local community and to control the bulk of the new architectural interventions.

POROSITY: control of permeability to facilitate air movement through the development to actively create a desirable micro-climate in the neighborhood.

PROXIMITY: generation of physical and visual network of spaces to improve connectivity from the lower levels to the higher levels of the vertical city and establish desirable destinations.

Re-introducing vitality back to the street-scape of the dense urban fabric goes a long way to promote healthy living among under-privileged communities as studies have shown that walking – often the *only* affordable form of exercise to these families – in a high density city increases significantly in a climatically comfortable and visually pleasant urban environment with salient destinations.

### Part 2: Elective Course SE3001 Architectural Spatial Analysis ((BSAS Year 3&4 / 40 students)

Rigorous evaluation of the student design schemes with established method is integral to the proposal. To promote the social art of architecture, the tools and methods of **space syntax**, which links user social behavior to spatial configuration, and **social network analysis**, are adopted for further assessment of the student projects in comparison to other state-of-the-art solutions. Tangible physical and visibility data – connectivity, integration, intelligibility, degree centrality, closeness centrality, betweenness centrality, etc – will be extracted from the above schemes to identify patterns and distinct categories of attributes. These results will be coupled with the findings from the community engagement workshops to establish, 1) a list of desirable attributes for the healthful vertical city, and 2) a typology of healthful vertical city prototypes, which can contribute to the discourse of ultra-high density architecture.

Students will learn and employ an array of space syntax and network analysis methods, as well as open source softwares, such as DepthmapX and Gephi, to conduct analyses. The outcome of this part of the proposal will be used in next year's cycle of design>analysis, creating a feedback loop to continually build up a knowledge base of design strategies and key attributes of healthful vertical architecture.

## General Performance Criteria

The proposed courses address key performance criteria specified in the **Hong Kong Institute of Architects and Architects Registration Board Accreditation of Architectural Programmes: Criteria and Procedures (July 2011)**. Details of criteria covered are listed in Appendix A.

## Outputs

- Part 1
- Precedent studies
  - Desirable attributes for *healthful vertical architecture*
  - Individual student design scheme (digital portfolio + model)
  - Public exhibition on campus and off campus in collaboration with user/expert partners
  - Publication showcasing student projects (including Part 2 outputs) and documenting the process, with essays by tutors, collaborators, and users/experts.
- Part 2
- Comparative analysis of student design schemes and latest state of the art of architectural

- design for high-rise residential designs
- Mapping of desirable attributes to space syntax and network analysis tangible measures
- Typology of *healthful vertical architecture*
- Report on community engagement workshop
- Research paper(s) for submission to refereed academic journals

### Intended Learning Outcomes from Social Art of Architecture Perspective

- Identify clear design intentions in relation to the social art of architecture
- Formulate design strategies to achieve the stipulated design intentions
- Generate spatial configurations that enhance social interaction and connectivity
- Produce an architectural design informed by social data and user expert recommendations
- Evaluate design schemes from a space syntax and network analysis perspective

### Additional Teaching Staff

**Part 1: Mr Atul Kansara**, Visiting Fellow, RIBA. 20+ years experience architect who have practiced in UK, Hong Kong and Singapore with major firms, such as Terry Farrell and Partners and HOK. **Mr John Cheng**, Adjunct Professor, B.Arch (USC), M.Arch (Harvard), RIBA, AIA, HKIA, ASC. Award-winning architect, including multiple AIA Hong Kong Chapter prizes and current Director at top local firm Ronald Lu & Partners.

**Part 2: Mr Ivan Ip**, Lecturer, MSc (Advanced Architectural Studies) (Bartlett), BArch, BSc (Hons) (Wales), RIBA, HKIA. Expert in space syntax analysis. **Dr Lu Yi**, Assistant Professor, B.Arch (Southeast), M.Arch (NUS), PhD (GATech). Expert in space syntax analysis.

### Participation of Consultants / User Experts

**Mr Wong Kam Sing**, Secretary of Environment, Hong Kong SAR Government. **Mr Ken Cheung**, Chief Architect, Hong Kong Housing Authority. **Mr Freddie Hai**, Chair, HKIA Planning and Lands Committee. **Mr Frankie Choi**, Chair, HKIA Environment and Sustainable Design Committee. **Mr Myron Ng**, Assistant Manager (Fresh Markets), Link REIT. **Dr Man Chi Sum**, Chief Executive Officer, Greenpower. **Dr Beisi Jia**, Associate Professor, Department of Architecture, University of Hong Kong. **Prof John Ng**, Chairperson, BEAM (Building Environmental Assessment Method) Society. **Mr Chan Siu Tong**, District Council Member, Yau Tsim Mong District Council, HKSAR. (The applicant has personally collaborated with all of the above proposed participants.) Other relevant NGOs plus residents of subject site.

### Co-teaching Activities

Visits to latest public and private high-rise residential developments. Visit to Hong Kong Housing Authority Exhibition Center. Visits and survey of retail spaces, fresh markets, community facilities, and other programs commonly found in podiums. Guest seminars. Community engagement workshops.

### Readings

- Glicksman, L. and Lin, J. (Eds.) (2006). *Sustainable Urban Housing in China: Principles and Case Studies for Low-Energy Design*. Dordrecht: Springer.
- Habraken, N. J. (2000). *The Structure of the Ordinary: Form and Control in the Built Environment*. Cambridge: The MIT Press.
- Hillier, B. (1996). *Space is the Machine: a Configurational Theory of Architecture*. Cambridge: Cambridge University Press.
- Hillier, B. and Hanson, J. (1984). *The Social Logic of Space*. Cambridge: Cambridge University Press.
- Kendall, S. and Teicher, J. (2000). *Residential Open Building*. London: Spon.
- Koolhaas, R. (2002). Junkspace. *October 100*, pp.175-190. Ng, E. (Ed.) (2010). *Designing High-density Cities for Social and Environmental Sustainability*. London: Earthscan.
- Pomeroy, J. (2014). *The Skycourt and Skygarden: Greening the Urban Habitat*. New York: Routledge.
- Rowe, P. (2011). *Emergent Architectural Territories in East Asian Cities*. Basel: Birkhauser.
- Steemers, K. and Steane, M. A. (Eds.) (2004). *Environmental Diversity in Architecture*. London: Spon.
- Taunton, M. (2009). *Fictions of the City: Class, Culture and Mass Housing in London and Paris (Language, Discourse, Society)*. London: Palgrave Macmillan.
- Urban, F. (2012). *Tower and Slab: Histories of Global Mass Housing*. New York: Routledge.
- Yuen, B. and Yeh, A. (Eds.) (2011). *High-rise Living in Asian Cities*. New York: Springer.

## **APPENDIX A: Performance Criteria Addressed by the Proposed Courses**

Form the *Hong Kong Institute of Architects and Architects Registration Board Accreditation of Architectural Programmes: Criteria and Procedures* (July 2011):

### Part 1: Design Studio SE4001 Architectural Design 6: Urban Interventions

#### **A2.5 SOCIETAL**

- (a) Human Behavior. Awareness of the theories and methods of inquiry that seek to show the relationship between human behavior and the physical environment.
- (b) Sustainable Development. Understanding of the basic principles of sustainable development and architects' responsibilities with respect to the social, economic and environmental sustainability in architecture and urban design.
- (c) Accessibility. Ability to design both sites and buildings to accommodate individuals with varying physical abilities.

#### **A2.6 TECHNICAL KNOWLEDGE**

- (c) Environmental Systems. Understanding of the basic principles that inform the design of environmental systems and green / sustainable architecture, including sustainable sites, energy and atmosphere, indoor environmental quality, materials and resources conservation, and water efficiency.

#### **A2.7 DESIGN**

- (a) Programme Preparation. Ability to assemble a comprehensive programme for an architecture project, including an assessment of client and user needs, a critical review of appropriate precedents, an inventory of space and equipment requirements, an analysis of site conditions, a review of the relevant laws and standards and an assessment of their implications for the project, and a definition of site selection and design assessment criteria.
- (b) Comprehensive Design. Ability to produce an architecture project informed by a programme, up to schematic design with consideration of structural and environmental systems, life-safety provisions, wall sections, and building assemblies, as appropriate; and to assess the completed project with respect to the programme's design criteria.
- (c) Site Conditions. Ability to respond to natural and built site characteristics in the development of a programme and design of a project.
- (d) Formal Ordering Systems. Understanding of the fundamentals of visual perception and the principles and systems of order that inform two- and three-dimensional design, architectural composition, and urban design.

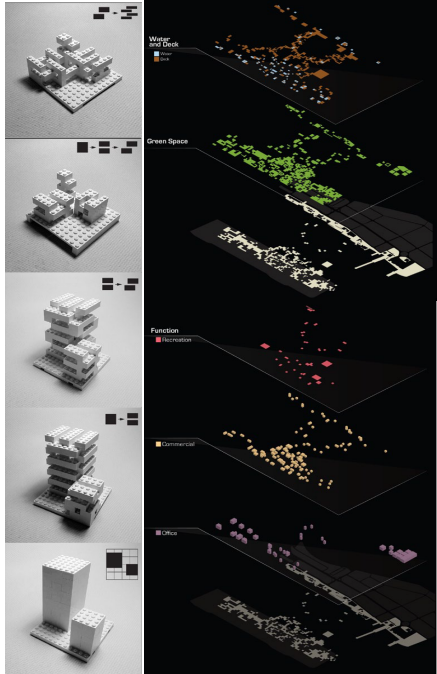
### Part 2: Elective Course SE3001 Architectural Spatial Analysis

#### **A2.9 SKILLS**

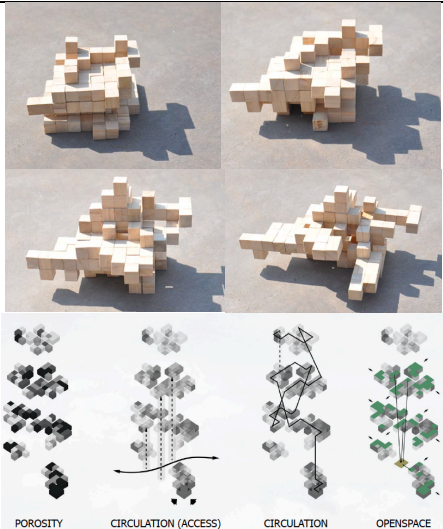
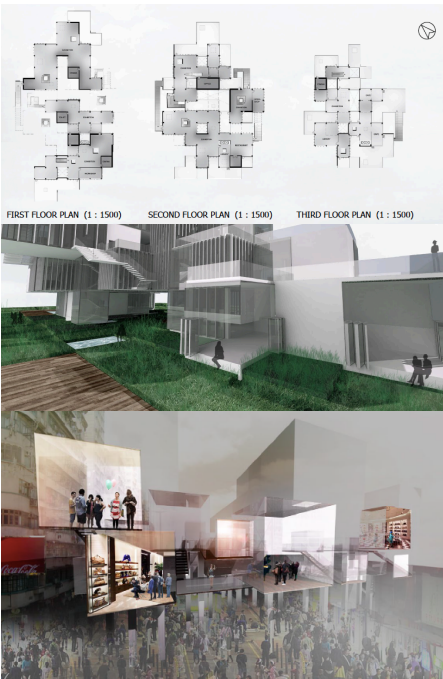
- (a) Collaborative and Participatory Skills. Ability to work cooperatively with others in a team setting. Ability to discuss architectural ideas with non-architects, to listen objectively to their opinions and to consider those opinions in designing.
- (d) Research Skills. Ability to employ basic methods of data collection and analysis to inform all aspects of the programming and design process.
- (e) Critical Thinking Skills. Ability to make a comprehensive analysis and evaluation of a building, building complex or urban space.

**Berkeley Prize 2014 Teaching Fellowship Application**  
**Studio and Spatial Analysis Course Schedule**  
**Bachelor of Science in Architectural Studies (BSAS), City University of Hong Kong**

**Part 1: Design Studio SE4001 Architectural Design 6: Urban Interventions (Fall 2014) Tues 2-6pm + Fri 2-6pm**

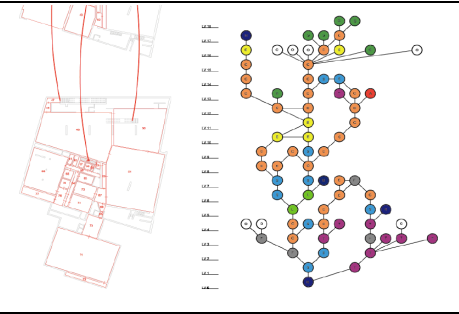
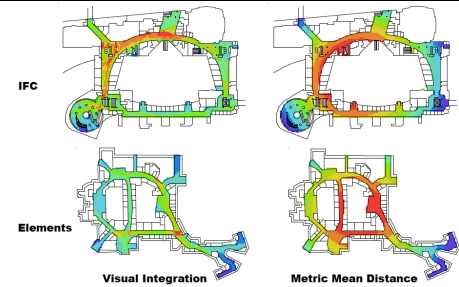
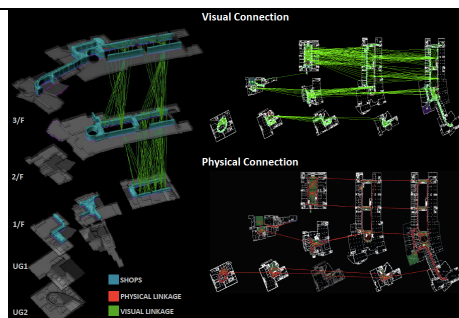
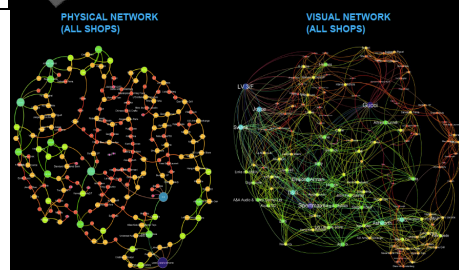
Week	Studio	Lectures / Seminars	Co-teaching Activities	
1	Site visit. Conduct site analysis. Collect site clues. Generate initial ideas.	Introduction to high-density living. (Dr J Wong)	Meet with local residents and shop owners.	
2	Master layout plan. Site level strategies. Sectional studies (composing a minimum of 10 cross sections to investigate relationship between programmatic spaces and street-scape).	Reducing urban heat island (UHI) through architectural design. (Dr C S Man)	Visit to public housing developments 1	
3	Review of sectional studies.	Latest trends in public housing design. (Mr K Cheung)		
4	Translation of 2D sectional strategies to 3D tectonic strategies to control <i>density</i> , <i>porosity</i> and <i>proximity</i> .		Visit to Hong Kong Housing Authority Exhibition Center.	
5	Using a 3x3x3 matrix, explore the different combinations of density, porosity and proximity using the same transformational strategy.	Open building – The structure of the ordinary. (Dr B Jia)		

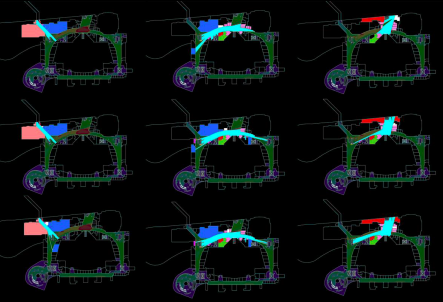




6	Generate spatial diagrams: (Open / close; Solid / transparent; Public / private; Program / circulation; Connectivity)	Micro-climate evaluation in high-rise buildings. (Prof J Ng)	Visit to public housing developments 2	
7	Produce preliminary architectural drawings (plans, sections and elevations). Generate a set of explanatory diagrams.			
8	Interim Review			
9	Development of preliminary concepts into a comprehensive design proposal comprising a full set of drawings, models at various scales, interior and exterior view renderings, explanatory diagrams. Review of design schemes.			
10		Latest trends in private housing design. (Mr J Cheng)	Visit to private housing developments	
11				
12				
13				
14	Final Review			
15	Digital portfolio submission by uploading onto Blackboard learning website			



## Part 2: Elective Course SE3001 Architectural Spatial Analysis ((Spring 2015) Wed 3-6pm

Week	Workshop	Lectures / Seminars	Co-teaching Activities	
1		Introduction to spatial analysis (Mr I Ip)		
2		Axial analysis (Mr I Ip)	Community Engagement Workshop	
3	Axial Analysis Workshop: Axial analysis of existing movement routes and major circulatory pattern of the lower levels of the site including ground floor site context.			
4		Justified graph analysis (Dr J Wong)	On-site observation and collection movement data 1	
5	Justified Graph Analysis: Analysis of spatial configuration of design schemes from Part 1 and their categorization.		Focus Group	
6		Introduction to visibility graph analysis (VGA) – Connectivity, integration and intelligibility (Dr Y Lu)		
7	Introduction to <i>DepthmapX</i> : Generation of general visual field properties of design schemes using visibility graph analysis (VGA).		On-site observation and collection movement data 2	
8		Modeling the built environment: Network centralities – Degree/ closeness / betweenness (Dr J Wong)		
9	Interim Presentation			
10	Introduction to <i>Gephi</i> : Collection of network centrality data – degree, closeness and betweenness – of the design schemes and correlation with site observation data.			

11		Visibility graph analysis 2 – Isovist properties (Dr Y Lu)		
12	Visualizing visibility data: Compiling and presenting the data and findings.			
13	Final Presentation			

All images are samples of student works from last year under the applicant’s supervision.

30 May 2014

To the Berkeley Prize 2014 Committee

**Re: Recommendation for Dr. Joseph Francis Wong for the Berkeley Prize 2014 Teaching Fellowship**

Dear Selection Committee Members,

As the current Head of the Division of Building Science and Technology, it is my pleasure to write in support of my colleague Dr. Joseph Francis Wong's proposal for the prestigious Berkeley Prize 2014.

The courses under Dr. Wong's proposal are respectively the Year 4 core studio course SE4001 Architectural Design 6: Urban Interventions offered during Semester A (Fall) and the Elective Course SE3001 Architectural Spatial Analysis offered in Semester B (Spring) that is opened to both Year 3 and 4 students. Both courses have been offered every year since their introduction in our new curriculum adopted in 2012.

We will be pleased to offer the two courses covered in Dr. Wong's proposal for the 2014-2015 academic year for typical course credit if he is selected for the Fellowship to further enhance the above courses.

Thank you.

Yours truly,



Professor C. M. Tam  
Professor  
Head of Division of Building Science and Technology