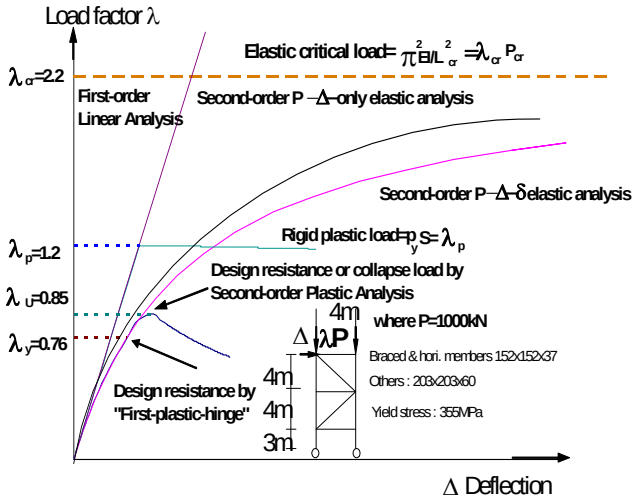
**1-day Intensive Course on**
**SECOND-ORDER ANALYSIS & DESIGN OF STEEL FRAMES TO CODE OF PRACTICE FOR THE STRUCTURAL USES OF STEEL 2005**

by

**Ir Professor S.L. Chan**
**Ph.D., FHKIE, MIStructE, FHKISC, RPE**

***Monday, 2 June 2008***

Jointly organised by
*The Hong Kong Institute of Steel Construction*
*&*
*Department of*
*Civil and Structural Engineering,*
*The Hong Kong Polytechnic University*




**Background :** The Code of Practice for the Structural Uses of Steel 2005 Hong Kong, has been in use in Hong Kong for design of steel structures. Second-order analysis has been applied as a versatile and more reliable design tool than the first-order linear analysis and This seminar is about the second-order analysis and connection design of steel frames to the code with an introduction to the underlying basic principles to various clauses and it has been delivered twice as indoor seminar at Government departments.

**Objectives :** The aim of the course is to provide the practicing engineer with an introduction to the design of steel framed structures to Code of Practice for the Structural Uses of Steel 2005 Hong Kong. Both the conventional and advanced computer methods will be described. Students will be given an on-hand experience of using non-linear analysis computer Nida© for second-order analysis and design of complete practical steel frames which include the two award wining projects.

**Who Should Attend:** The course is designed for engineers in practice or associated with the Structural Engineering industry. It is also suitable for senior undergraduate and post-graduate students presently engaged in study and/or research in Structural Engineering. ***Engineers, who want to enhance their competitiveness in design skill for steel structures, are strongly encouraged to attend.***

**CPD Credit:** The course is designed for 1 CPD day. A certificate of attendance will be available upon request.

**Medium of Instruction:** The medium of instruction will be in English.

**References for Course:**
A set of Lecture notes will be distributed. A trial version of Nida with limited capacity for second-order analysis of steel framed structure is also distributed to allow the students to obtain an on-hand experience on the new method.

**Fee:** HK$900 (includes course fees, a trial software, course notes and refreshments).

**Further Information:** For course content and technical information, please contact Professor S.L. Chan (Tel. 2766 6047), Course Speaker, Department of Civil and Structural Engineering, The Hong Kong Polytechnic University.

**Venue: Room N001**, The Hong Kong Polytechnic University, Hung Hom, Kowloon.

**Narrative Biography of Speaker:**

**Ir Professor S.L. Chan** is now with the Department of Civil and Structural Engineering of The Hong Kong Polytechnic University. Professor Chan's research interests include the stability analysis and design of steel, nonlinear finite element analysis, glass and slender skeletal structures, steel, bamboo and aluminum scaffolding and pre-tensioning steel structures. He has published more than 250 papers in journals, books, conferences and keynote/invited papers in major steel conferences overseas. His book, "Non-linear static and cyclic analysis of steel frames with semi-rigid connections, Elsevier, 2000, pp.336", summarises his work in the area before 2000. Currently Professor Chan is the chief editor of the "Advanced Steel Construction", "Steel and Composite Structures (2002-2005)", an International Journal and "International Journal of Applied Mechanics and Engineering". He also serves as a member of editorial boards in 7 other journals, and of ad-hoc committees in drafting guides for design of steel and glass structures in Hong Kong and the U.K. He was also selected as a member representing Hong Kong in the Research Panel of the Institution of Structural Engineers, U.K. and a member of expert panel of American Institute of Steel Construction (AISC), the President of the Hong Kong Institute of Steel Construction (HKISC) and adjunct professor at the Southeast University, Nanjing, Harbin Institute of

Technology in Harbin and Tongji University in Shanghai. He is also a member of the editorial team of the textbook “Structural Uses of Glass” published by the Institution of Structural Engineers, U.K. which has been used as a guidebook for design of glass structures in U.K., Hong Kong and Southeast Asia.

Ir Professor Chan is a consultant of the Code of Practice for the Structural Uses of Steel 2005 Hong Kong published by the Buildings Department. He developed a new, practical design method bypassing the prescriptive use of charts and tables in Code and coded the method in his developed computer program, Nida. Since 1998, the method of second-order and advanced analysis has been applied to the design of a number of practical steel structures which include numerous steel structures in Hong Kong and Macau such as those in East Asian Game, the. memorial hall and of the 22.8m clear span space framed roof in Olympian station and the 2008 award winning projects in Hong Kong and Macau. The software Nida has been used by universities and companies in Australia, China, Hong Kong, Taiwan, and U.K. for teaching, research and practical design.

**Course Programme:**

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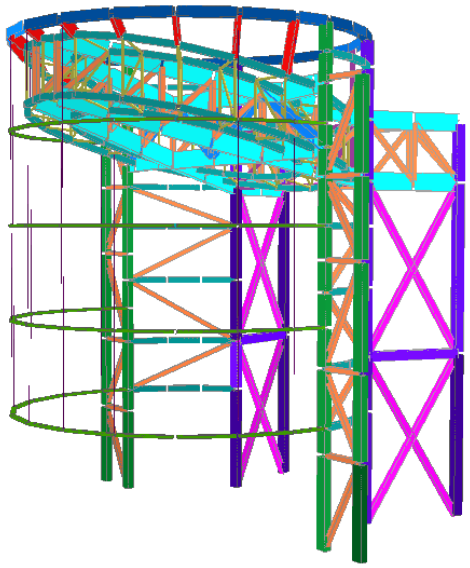
|---|---|
| 08:45 - 09:00 | Registration |
| 09:00 - 10:30 | Introduction – Background of limit state design code. Design of compression and tension members. |
| 10:30 - 10:45 | *Tea break* |
| 10:45 - 12:15 | Design of steel frames by conventional methods ; Sway amplification method for sway frames, design charts for sway and non-sway frames, elastic buckling load factor $\lambda_{cr}$. Determination of $\lambda_{cr}$ by computers and by hand method. |
| 12:15 – 14:00 | *lunch* |
| 14:00 - 15:30 | Nonlinear numerical methods ; the load control Newton Raphson method. Numerical convergency. Local member and global frame imperfections ; initial member curvature and out-of-plumbness in building frames. Methods to consider imperfections ; notional force and eigen buckling mode methods. Design of practical steel frames using second-order computer analysis software. |
| 15:30 – 15:45 | *Tea break* |
| 15:45 - 17:15 | Tutorial examples using software Nida. Design examples of large, medium and small steel frames and large span trusses, cross bracing systems, columns under variable loads, portal frames, braced and unbraced frames. |



**Application Form**

**Course: - Second-order analysis & design of steel frames to Code of Practice for the Structural Uses of Steel 2005 Hong Kong** *(2 June 2008)*

Fee: HK$900 (includes course fees, course notes and refreshments).

Text: To be distributed by the speakers.

Name : Mr. / Ms. /Ir /Dr / Prof. _____ In Chinese : _____
(in block letters, surname first) (Please use the same name as on your H.K. Identity Card)

Address: _____

_____ Mobile No. / Tel. No.: _____

Employer's Name _____
And Address : _____ Tel. No.: _____

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Position Held : _____ Email: _____

Please send application form with cheque* to Mr. Sam Chan, The Hong Kong Institute of Steel Construction c/o TU743 The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong (Tel.: 852-2766-6020 / 852-2766-6051, Fax: 852-2334-6389).

*Cheques should be crossed and made payble to **Hong Kong Institute of Steel Construction Limited**, fees are non-refundable. Places are limited; therefore, early application is strongly advised. **The closing date for application is 21st May 2008 (Wednesday).**