Introduction
This course is aimed at providing civil and structural engineers a good understanding of the general rules, main features and changes contained in Eurocode 3 and the accompanying Singapore National Annexes. Reference will be made to the accompanying codes EC0 (Basis of Structural Design) and EC1 (Actions on Structures). The course will cover the basis of structural component and frame design, structural loading, material properties, design at the ultimate limit state and the serviceability limit state. Practical examples with direct reference to the code clauses will be used to illustrate the application of the code requirements. Case studies are provided to illustrate clearly the theory of structural stability and design and how they can be applied to avoid structural collapse.

Objectives
After attending the course, participants will be able to:
1. Enhance their understanding of Eurocode provisions for the design of steel structures;
2. Apply design principles and standards in accordance with Eurocode 3 and Singapore national annexes in the design of steel buildings;
3. Design structural steel frames and components in accordance with Eurocode 3 design principles & methodology.
4. Avoid common mistakes in design with lessons learned from case studies and collapse investigations.

Course Content
(i) Introduction to EC3 steel design
   Overview of Eurocodes EC0, EC1 and EC3; mechanical properties of steel; basis of design and loads; limit states design; partial factors for actions and strength; load combinations; consideration of imperfections; examples.
(ii) Local buckling and cross-section classification
   Plate stability; slenderness limits; effective cross sections.
(iii) Restrained beams: In-plane bending, shear, deflections.
(iv) Unrestrained beams: Lateral torsional buckling; unbraced length; lateral restraints; design procedure
(v) Tension members: Section capacity with holes; angles and channel section; capacity of welded and bolted sections; plate with staggered bolt arrangement.
(vi) Compression members: Factors affecting column buckling; column effective buckling length; buckling curves.
(vii) Design of beam-column: Design approach; Interaction formulae; biaxial and uniaxial bending; columns in simple construction
(viii) Plate girders: Initial sizing; moment capacity; web capacity; shear buckling; design of intermediate, transverse and load bearing stiffener; end post design.
(ix) Frames and Trusses: plane truss; space truss; braced and unbraced frames; lateral stability
(x) Bracing and Ties: Evaluation of buckling length; effective lateral restraints; stability consideration during construction; construction sequence; lessons learned from common mistakes.
(xi) Portal frames: frame geometry, structural bracing; classification of nonsway frame; design checks for members; sway stability check; buckling between intermediate and torsional restraints.
ER PROF RICHARD LIEW - BEng (Hons), MEng, PhD, CEng, PEng, ACPE, StEr
Professor of the National University of Singapore, Department of Civil and Environmental Engineering.

Prof Richard Liew is a Chartered Engineer and Professional Engineer. He joined NUS in 1986 where he lectured, conducted research and provided short courses and consultancy services to the industry especially in the field of steel and composite structural engineering. He has been awarded with multiple teaching excellence awards by the faculty of Engineering over the years. He is world-renowned as an expert of advanced analysis and the application of theory of stability and plasticity in structural and offshore engineering with emphasis on robustness and hazard assessments including the effects due to fire, blast and impact loads. He has authored and co-authored five books and published over 300 technical papers. He is a member of the Institution of Structural Engineers (UK) and the Institution of Engineers, Singapore, and the Honorary Fellow of Hong Kong Institute of Steel Construction and Singapore Structural Steel Society. He has served in numerous international and local technical committees relating to material and building standards. He is currently a member of SPRING, Singapore’s Technical Committee on Building Structure and wherein he also serves as a Convenor on the adoption of Eurocode 3 and Eurocode 4 in Singapore and chairing several workgroups for Eurocodes 3 and 4.

DR PANG SZE DAI
Assistant Professor of the National University of Singapore, Department of Civil and Environmental Engineering
Dr Pang Sze DAI joined NUS in 2006 where he lectured in courses on structural steel design and system, structural stability and dynamics and has been awarded with multiple teaching excellence awards by the University and the faculty over the years. He has provided regular short courses in Singapore and Malaysia on design of buildings against seismic actions using the UBC, IBC and Eurocode 8 and provided consultancy services to the industry in the fields of structural stability and steel design. He is active in the research of composites for structural and offshore applications and in advanced numerical analysis of complex problems. He is a member of the Institution of Engineers, Singapore and an observer in the Singapore Structural Steel Society council.

Registration Form - 2-Day Course on Design of Steel Buildings using Eurocode 3

Date: ___________________________
Time: 9.00am to 5.00pm (Registration starts at 8.30am)
Venue: BCA Academy

Name of Participant: ___________________________
NRIC/Passport No: ___________________________
Designation: ___________________________
Hp no.: ___________________________
Email: ___________________________

Company Name: ___________________________
Company UEN No: ___________________________

Contact Person Particulars
Name: (Dr/Mr/Mrs/Ms) ___________________________
Designation: ___________________________
Telephone No.: ___________________________
Fax no.: ___________________________

Payment
Enclosed is a cheque no. ___________________________ (Cheque should be crossed, marked “account payee only” and payable to ‘BCA’) for S$ ___________________________

OR Deduct from GIRO acc. No ___________________________ (should be the same bank account number as indicated in the Direct Debit Authorisation form submitted to BCA)

Name/Signature (*Company / individual applicant)
(For company stamp)

We agree to allow BCA to disclose to other government agencies and / or the Government any information relating to me/us in connection with, arising from or relating to this application, including but not limited to my/our personal particulars and my/our test results.

Request for Replacement and/or Withdrawal

- Request for replacement in writing, must reach BCA Academy before the commencement date of the seminar: No administrative charge
- Request for withdrawal in writing, that reaches BCA Academy at least 2 weeks before the seminar date: 50% refund of seminar fee
- Request for withdrawal in writing, that reaches BCA Academy less than 2 weeks but more than 3 working days before the seminar date: 75% refund of seminar fee
- Request for withdrawal in writing, that reaches BCA Academy 3 working days or less before the seminar date: No refund of seminar fee

BAC Academy reserves the right to amend the seminar details or cancel the seminar and fully refund the participants should unforeseen circumstances warrant it.

Enquiries
For enquiries, please call 6248-9999
or email us at bca_academy@bca.gov.sg

For details of other seminars and courses, please visit our website @ www.bcaa.edu.sg

Registration
Seats are limited, registration is on a first-come, first served basis. Training places will be confirmed upon the payment of the seminar fees before the commencement date. Please fax application form to 6258-0558. Cheques with original application and supporting documents should be mailed to BCA Academy, 200 Braddell Road, Singapore 579700

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