Synopsis
This course covers topics rarely covered to any great extent at undergraduate level. The emphasis is on hand-based methods. They can be used directly for design or for the checking of computer-based designs. However, rather than just providing an alternate design method of equal difficulty to conventional procedures, it will be found that many problems can be tackled surprisingly easily using these powerful methods. The methods are an aid to understanding. Many worked examples are presented showing how the various methods can be used. The emphasis is on the use of the methods for practical problem solving, so little theory is presented. Appropriate reference will also be made to SS EN 1992 series on Design of Concrete Structures.

Course Outline:
- **Design Methods:**
  Elastic and Plastic based design; lower/upper bound and uniqueness theorems of plastic collapse and their importance in every-day elastic-based design; redistribution: the ‘half-way house’; limitation of commonly used elastic-only software will be understood.

- **Plastic Design:**
  Suitable for the design of beams and one-way slabs. Plastic design of beams, as well as slabs, is now allowed (allowed by the current code, EC2 but not by the previous code, BS8110), so it is timely to review the benefits of a plastic-based design.

- **Strut-and-Tie Method:**
  Suitable for the design of reinforced concrete deep beams, pile caps and corbels.

- **Yield-Line Method:**
  Suitable for the design of one-way and two-ways slabs, both regular and irregular flat slabs, transfer slabs and rafts.

- **Compressive Force Path Method:**
  Suitable for the design beams and slabs. A fundamental approach of shear leads to a powerful model that can be used for the design of reinforced and prestressed concrete beams and flat slabs.

- **Reinforcement Detailing:**
  Discussion of curtailment of top and bottom reinforcement; common detailing errors.

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Programme Details

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<th>Course Date:</th>
<th>23 Oct 2018, Tuesday</th>
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<tbody>
<tr>
<td>Duration:</td>
<td>1 day</td>
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<tr>
<td>Time:</td>
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<td>7PDU/6 STU(Structural)  – All Confirmed</td>
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<td>Course Fee:</td>
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<td>$353.10 (Non member)</td>
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<td>Venue:</td>
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<td>80 Jurong East Street 21</td>
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<td>#04-10 Devan Nair Institute</td>
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<td>Singapore 609607</td>
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Funding Support:
SkillsFuture Credit Supported UTAP (for NTUC Union Members) – (T&C apply)

*Certificate of Attendance for participant with 100% attendance
*Course fee includes course materials, Halal refreshments and 7% GST
Target Audience
Design and Professional Engineers

Speaker’s Profile

Er. Dr Niall MacAlevey is currently an independent consultant specializing in the analysis and design of reinforced and prestressed concrete structures, forensic engineering and the strengthening of concrete structures. He is the founder of the firm ‘Shamrock Consultants’, is a member of The Institution of Engineers of Ireland and is a registered Professional Engineer in Singapore.

After graduating from University College Dublin, Ireland in 1987 with a B.E (Civil) degree, he then obtained his M.Sc. degree in “Concrete Structures” at Imperial College, London in 1988. He completed his Ph.D degree at the Nanyang Technological University in 1997 on “The Strengthening of Concrete Structures” and later joined the academic staff there. He obtained a PGDipTHE (Post-Graduate Diploma in Teaching in Higher Education) from the National Institute of Education in 2001.

He has worked for a number of consulting engineering firms and specialist prestressing subcontractors in London, Cambridge, Hong Kong and Singapore. He is the author of four books "Structural Engineering Failures: lessons for design", Preliminary Design of High-Rise Buildings in Non-Seismic Regions, Design of Reinforced Buildings to Resist Blast and Prestressed Concrete in Buildings. All books are available from Amazon.com
## Registration Form

**Advanced Structural Concrete Design – 2nd Run**

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</tr>
</tbody>
</table>
| Venue              | IES Academy@Jurong East, 80 Jurong East St 21 #04-10  
Devan Nair Institute S(609607) |
| Course Fee         | $299.60 (IES Members); $353.10 (Non members) |

**Course Coordinator**

Lee Woon  
IES Academy@Jurong East  
80 Jurong East Street 21 #04-10  
Devan Nair Institute for Employment & Employability  
Singapore 609608  
Tel: 6461 1250  
Email: hon.lw@iesnet.org.sg

**Last Date of Registration**

12 Oct 2018 or till class fully booked (whichever comes first)

### Participant’s Details

- **Name**:  
- **Nric/Fin No**:  
- **Company**:  
- **Designation**:  
- **Address**:  
- **Postal**:  
- **Office No**:  
- **Mobile**:  
- **Fax**:  
- **Email**:  

**Please indicate**

- IES Member No:  
- Non-Member:  
- RTO/RE/PE No:  
- Sponsored by Company:  
- Special Meal Request – Vegetarian

**Contact Person (HR/Accounts Department)**

- **Name**:  
- **Designation**:  
- **Office No**:  
- **Fax**:  
- **Email**:  

**Payment**

- **Cash/Nets/Cheque**:  
- **Amount**:  

- Cheque to be made payable to ‘ENGINEERS SINGAPORE PTE LTD’  
- Written Notice via email is required for Cancellation or Withdrawal of course, 7 working days prior to course date  
- Course fee inclusive of 7% GST, course materials and Halal refreshments  
- Certificate of Attendance will be issued to participants with 100% Attendance

**Acceptance of Terms & Conditions for Registration of IES Academy Courses / Events**

I agree to abide to the Terms & Conditions for Registration of IES Academy courses and events

- **Name**:  
- **Signature**:  
- **Date**:  

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*Note: The document contains specific details about a course registration, including dates, fees, and contact information for the course coordinator.*
TERMS & CONDITIONS COURSE REGISTRATION

Registration
Any registration, whether online, fax or by email, will be based on a first-come-first-served basis and will only be confirmed upon receipt of full payment by Engineers Singapore Pte Ltd unless otherwise invoice to company. All registrations must be submitted with duly completed registration form.

Closing Date & Payment
The closing date of the event will be 1 week prior to event commencement date. Cheques should be crossed 'A/C payee only' and made payable to ‘ENGINEERS SINGAPORE PTE LTD’, with the Date of event, Title of The Event and participants’ name indicated clearly on the back of the cheque, and post to:

Attn: Lee Woon
IES Academy@Jurong East
80 Jurong East Street 21 #04-10
Devan Nair Institute for Employment & Employability
Singapore 609607

Confirmation of Registration
Confirmation of registration will be given at least one week before the commencement date of event via email. If you do not receive the said confirmation email, you are required to contact IES Academy at general admin immediately at 6463 9211 (office).

IESA reserves the right to allow only confirmed and paid registrants to attend the Event.

Withdrawals/Refunds of Fees
Written notice at least 1 week in advance before the commencement of the event
Full course fee shall be refunded subjected to 4.5% transaction charge
➢ NO refund otherwise.

No-show of participant would not be accepted as a valid reason for withdrawal/refund. One time replacement is allowed only if written notice is received by us at least 1 week before the commencement of the event. However, when an IES member is replaced by a non-member, the participant has to pay the difference in the relevant fees.

Cancellation/Postponement
Changes in Venue, Dates, Time and Speakers for the Events can occur due to unforeseen circumstances. IESA reserves the full rights to cancel or postpone the Event under such circumstances without prior reasons. Every effort, however, will be made to inform the participants or contact person of any cancellation or postponement.

Fees will be refunded in FULL if any Event is cancelled by IESA.

UTAP (Union Training Assistance Programme) is an individual skills upgrading account especially for NTUC members. As a member, you enjoy UTAP funding at 50% of the unfunded course fee capped at $250 every year.

SkillsFuture Credit (SFC) “All Singaporeans aged 25 and above can use their $500 SkillsFuture Credit from the government to pay for a wide range of approved skills-related courses. Visit the SkillsFuture Credit website (www.skillsfuture.sg/credit) to choose from the courses available on the SkillsFuture Credit course directory.”

Please visit HERE for more information on SFC & UTAP claim.

Personal Data Protection Act
By registration, you consent to the processing by Institution of Engineers, Singapore of personal data, including your sensitive personal data as defined in the Data Protection Act 2014 for the proper purposes of Institution of Engineers, Singapore (IES). You undertake to observe the provisions of the Data Protection Act 2014 in relation to any personal data you may hold and process as a Members of Institution of Engineers, Singapore, and you agree to indemnify Institution of Engineers, Singapore from liability for any claims or damages that may arise from the processing of this data. For more information kindly refer to: www.ies.org.sg/PDPA.

Enquiries
For further enquiries, please contact IESA general office at Tel: 6463 9211.