Control System Design for Switch Mode Power Supply

Training Programme
by
Dream Catcher Consulting Sdn Bhd

18 - 19 Jul 19
Dream Catcher Consulting Sdn Bhd, Penang

303-4-5 & 303-4-6 Block B, Krystal Point
Jln Sultan Azlan Shah 11900 Sg Nibong Penang, Malaysia
http://dreamcatcher.asia
enquiry@dreamcatcher.asia
+604 640 7111 / 7112
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Synopsis

Switch Mode Power Supply (SMPS) utilizes solid state switching devices operating in high frequency digital mode to deliver well-regulated DC outputs that are essential to drive a wide variety of today’s electronics equipment and systems. Unlike other technologies which usually require knowledge in only one key area, SMPS encompasses a wide range of knowledge in areas that include power engineering, high frequency electronics design, control loop design, understanding of component and device characteristics, EMI and PCB layout. As an essential part of all electronic equipment and systems, it is important that engineers and technicians whose work involve the design, production and integration of SPMS into other systems to have a sound knowledge on the working principles and various aspects of a SMPS.

This course covers the various aspects of the control loop operation and design specifically targeting the SMPS. An overview of control loop operation is first presented. Relevant aspects of control loop operations and design related to SMPS are then discussed. Control loop circuits operation and implementations are described. System models of the various SMPS topologies are introduced, followed by the various compensator designs for the different types of system.

What previous participants say about this course
Answers to the question 'what did you like most about the course':

- "Some tricks of design compensation circuiting" - 5 Jul 07
- "The many rule of thumbs, dos and don't that is directly applicable to be used in daily design applications, especially for beginners. The mathlab exercise is very good too" - 5 Jul 07
- "Practical. The material which presented by instructor is easier tie to real life application. (related to working environment)" - 25 Feb 08
- "Learn a lot about compensator, concept and application" - 29 Sept 09
- "Type of compensation to encounter instability and suppress noise" - 20 Oct 10
- "The way to explain the circuit and application" - 26 Jul 11
- "Example of material to show the understanding of control system design" - 26 Jun 12
- "The topic itself is very useful and important for power supply design." - 26 Jun 12

What You Will Learn

- Relevant aspects of control loop operations and design related to SMPS
- Control loop circuits operation and implementations
- System models of the various SMPS topologies
- Compensator designs for the different types of system

Who Should Attend

Engineers and technicians who work with SMPS in the role of:

- design and development
- product engineering
- test development
- application engineering
- product marketing
- testing
- system architect

**Prerequisite**

Technical background or working experience with electronic circuit design or SMPS.

**Course Methodology**

This course is presented classroom style, with case studies to illustrate the concepts taught.

**Course Duration**

2 day(s), 9am - 5pm

**Course Structure**

1) Classical feedback control system
   - Operation
   - features

2) 2nd order System response in time domain
   - Effect of damping ratio.

3) Laplace Transform and s domain
   - poles and zero
   - root locus plot

4) Frequency response for SMPS
   - Bode plot
   - phase margin
   - gain margin

5) Feedback Control circuit
   - Implementation
   - operation

6) System models of SMPS topologies

7) Compensator designs
Course Instructor(s)

Assoc Prof Dr Nicholas Vun Chan Hua

Nicholas Vun obtained his B.Eng (1st class Honours) and M.Eng.Sci. from Monash University, Australia, and his PhD from Nanyang Technological University, Singapore. He is currently holding an Associate Professor position in NTU’s School of Computer Engineering, and has been teaching courses in electronics design, control & instrumentation, microprocessor systems as well as embedded system design and applications. In addition, he has also conducted many public and in-house technical courses for audiences in Singapore and Malaysia over the years. His current research interests include application of number theory for signal conversion and signal processing, as well as embedded system design and applications.

Prior to joining NTU, he worked with Ausmode Power Systems and Exicom Power Systems in Australia, specialising in the design of switch mode power supply and embedded control systems for telecommunication equipment. He had also provided consultation services in areas of power supply design and embedded control system design to companies in Malaysia, Singapore, India, and Australia.

Nicholas Vun is a registered Professional Engineer with Singapore's Professional Engineers Board, and a senior member of IEEE. He is also the founding chairman of the IEEE Consumer Electronics Society of Singapore, and served as the conference chairman for the 1997 and 2011 IEEE ISCE conferences. In addition, he has also involved in many technical program committees of various international IEEE conferences, and is currently an Associate Editor for IEEE Consumer Electronic Magazine.
Administrative Details

Programme Logistics

Duration: 2 day(s), 9am - 5pm  
Date: 18 - 19 Jul 19  
Venue: Dream Catcher Consulting Sdn Bhd, Penang

Morning break, lunch and tea break will be provided throughout the course duration. Course Manual and Certificate of Attendance will be provided.

Your Investment

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<tr>
<th>Condition</th>
<th>Price per Pax</th>
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<tr>
<td>Regular fee</td>
<td>RM2,420.00</td>
<td>RM145.20</td>
<td>RM2,565.20</td>
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<td>Early bird discount for registration before 20-Jun-2019. N/A for SBL KHAS</td>
<td>RM2,200.00</td>
<td>RM132.00</td>
<td>RM2,332.00</td>
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<td>Group discount for every 3 pax registered, receive 1 complimentary seat</td>
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Additional cost may incur for customization or extra material request. Course fee is 100% claimable from PSMB (SBL scheme) in accordance to PSMB guidelines.

3 Easy Steps to Register

- **Phone** +604 640 7111 / 7112
- **Fax registration form** to +604 640 7110
- **Email registration form** to register@dreamcatcher.asia
**Method of Payment**

Crossed cheque / bank draft made in favour of DREAM CATCHER CONSULTING SDN BHD. Registration form together with payment to be couriered to:

Dream Catcher Consulting Sdn Bhd  
303-4-5 & 303-4-6  
Block B, Krystal Point  
Jln Sultan Azlan Shah  
11900 Sg Nibong  
Penang, Malaysia

Payment must be received no later than 10 working days before the course commences. An undertaking may be accepted in cases where payment is delayed. However all payments must be made before the course commences.  
*Closing registration date is 04-Jul-2019.*

**Refund and Cancellation**

Fees will only be refunded in full for cancellation received in writing more than 10 working days prior to the commencement date. Substitute attendee(s) will be accepted at no extra charge.

**Disclaimer**

Dream Catcher Consulting Sdn Bhd reserves the right to change the instructors, date and to vary/cancel the programme should unavoidable circumstances arise. All effort will be taken to inform participants of the changes. Upon sending the registration form, you are deemed to have read and accepted the terms.

**Enquiries**

call us at +604 640 7111 / 7112 or email us at enquiry@dreamcatcher.asia
## Registration Form

<table>
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<th>No.</th>
<th>Name</th>
<th>Job Title</th>
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**Registration Information**

- **Course Title**: Control System Design For Switch Mode Power Supply
- **Course Date**: 18 - 19 Jul 19
- **Location**: Dream Catcher Consulting Sdn Bhd, Penang

*(Emails are required to ensure notification of any changes reach the participant)*

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**Total Amount**

*(Emails are required to ensure notification of any changes reach the participant)*

**Submitted by**

- **Company Name:**
- **Company Address:**
- **Contact Person:**
- **Designation:**
- **Dept:**
- **Phone:**
- **Email:**

*Please complete this form with an authorised signature below and fax to fax registration form to +604 640 7110 or email to email registration form to register@dreamcatcher.asia. Call us at phone +604 640 7111 / 7112 for any enquiry*

**Authorised Signature:**

*Please print full name (authorised signature) if you submit via email*

- **Name:**
- **Designation:**
- **Dept:**
- **Date:**

*This registration is invalid without a signature. Payment must be made no later than 10 working days before the course commences. An undertaking may be accepted in cases where payment is delayed. However all payment must be made before the course commences. Participants who registered but did not attend will be invoiced accordingly. Fees will only be refunded in full for cancellation received in writing more than 10 working days prior to the commencement date. Substitute attendee(s) will be accepted at no extra charge.*

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Enclosed cheque/bank draft no ________________________ made in favour of DREAM CATCHER CONSULTING SDN BHD