

Intensive Course on ‘Analog Power Circuitry - its Mathematics and Physics’ by Professor Keng-Chi Wu

吳耿志教授密集課程「類比電路—其數學及物理」

Duration: 18 hours (3 days, 6 hours per day)

Date: 25-27 October 2016

Time: 09:00-12:00 and 14:00-17:00 daily

Venue: Department of Electrical and Computer Engineering, National Chiao Tung University

Topics:

1. Capacitance and Inductance – Differential form: voltage/current extreme, zero-crossing
2. Capacitance and Inductance – Integral form: lead/lag, continuity,
3. 1st order RC, RL
4. Periodic drive, RC filter, continuity of state, ripple content
5. Fourier decomposition, content, orthogonal, Fourier transform, Laplace transform
6. RC filter application, motor speed, Hall sensor, comparator, f-v conversion
7. Full-wave rectifier, loaded RC filter, continuity, boundary condition
8. LM555 timer, sawtooth, PWM, VCO
9. Simple current source, differential pair, level shifting, driver, high gain differential amplifier
10. Precision current source, TEC (Thermal Electric Cooler), Laser driver
11. Operational amplifier, single pole/zero, double pole/zero, type-II, type-III
12. 2nd order, oscillation, damping, control damping, feedback, Sallen Key filter
13. Linear regulator, DC close-loop, component sensitivity, ac closed loop, loop gain, compensation, stability
14. Switch-mode converter, B/H loop, Eigen value, Eigen vector, accelerated steady state,
15. TIROS (weather satellite) instrument DC/DC Converter DC and AC analysis
16. Power Converter with Digital Filter control
17. Solar Power system and applications
18. More if needed at different depth

吳耿志教授 1948 年生於嘉義縣大林鎮，為新竹國立交通大學控制工程學士（1969 年）及美國西北大學生醫工程碩士（1973 年），1980 年至 2010 年期間專門從事人造衛星及神盾軍艦之電力系統設計，2010 年 2 月自 Lockheed Martin 退休，目前已出版五本電源供應書籍，並於 2003 年及 2006 年兩度獲得 Lockheed Martin 年度作家獎；此外，亦有十餘件專利並熱心支持國際電機電子工程師學會（IEEE），其第五本著作「電力轉換器與數值濾波迴授控制」於 2016 年 2 月由英國牛津 Elsevier Academic Press 出版。

Keng C. Wu, born in 1948 in Talin, Chiayi, Taiwan, received the B.S. degree from the National Chiao Tung University, Taiwan in 1969, and the M.S. degree from Northwestern University, Evanston, Illinois in 1973. He was a lead member and a technical staff of Lockheed Martin, Moorestown, NJ. He has published five books, including “Pulse Width Modulated DC-DC Converters” (Chapman & Hall, January 1997), “Transistor Circuits for Spacecraft Power System” (Kluwer Academic Publishers, November 2002) “Switch-mode Power Converters: Design and Analysis” (Academic Press, Elsevier, Oxford, UK, November 2005) and “Power Rectifiers, Inverters, and Converter” (Lulu.com, November 2008). He holds dozen U.S. patents, was awarded “Author of the Year” twice (2003 and 2006 Lockheed Martin), and presented a 3-hour educational seminar IEEE APEC-2007. His fifth book “Power Converter with Digital Filter Feedback Control” was released in February 2016 by Academic Press, Elsevier, Oxford, UK.