Analog Circuits and Systems 1 - Video course

COURSE OUTLINE

The main aim of the course 'Analog Circuits and Systems 1' is to design analog circuits and systems that perform signal conditioning, signal processing functions, and signal generation using the devices including Op-Amps, amplifiers, and comparators.

COURSE DETAIL

Sl. No.	Module Name	Lecture Name
1	Module 1: Electronic Systems	1. Introduction to Sensors, Signals and Systems 2. Role of Analog Signal Processing in Electronic Products – Part I 3. Role of Analog Signal Processing in Electronic Products – Part II
2	Module 2: Analog Signal Processing by One-port and Two-port Networks	4. Analog Signal Processing using One Port Networks 5. Analog Signal Processing using One Port Networks, Passive Two Ports and Ideal amplifiers 6. Synthesis of Amplifiers using Nullators and Norators
3	Module 3: Devices for Analog Signal Processing	7. Passive Electronic Devices for Analog Signal Processing 8. Active Devices for Analog Signal Processing Systems 9. Electronic Devices for Analog Circuits– Part I 10. Electronic Devices for Analog Circuits– Part II
4	Module 4: Feedback in Systems	11. Feedback in Systems 12. Static Charecteristic of Feedback Systems 13. Dynamic Behaviour of Feedback Systems– Part I 14. Dynamic Behavior of Feedback Systems – Part II
5	Module 5: Signal Processing using Op-Amps	15. Design of Feedback Amplifiers – Part I 16. Design of Feedback Amplifiers – Part II 17. Design of Feedback Amplifiers and Instrumentation Amplifiers 18. Instrumentation Amplifiers, Integrators and Differentiators 19. Non-linear Analog Signal Processing 20. DC Voltage Regulators
6	Module 6: Analog Filters	21. Filters – Approximations to ideal filter functions 22. Passive Filters – Part I 23. Passive Filters – Part II 24. Active Filters – Part I 25. Active Filters – Part II 26. Active Filters: Q-enhancement 27. State Space Filters 28. Universal Active Filter – Effect of Active Device GB 29. State-Space Filters (Tuning of Filters) 30. Automatic Tuning of Filters (PLL) and Review of Filter Design

NPTEL

http://nptel.ac.in

Electronics & Communication Engineering

Pre-requisites:

Network Theory, Differential Equations, Laplace Transforms and Matrices

Hyperlinks:

1. https://archive.org/details/ApplicationsOfOperationalAmplifiers-3rdGenerationTechniques (Applications of Operational Amplifiers: Third Generation Techniques (The BB electronics series); Jerald G. Graeme (Author); Mcgraw-Hill (Tx); First Edition 1973)
2. http://ocw.mit.edu/resources/res-6-010-electronic-feedback-systems-spring-2013/textbook/ (Operational Amplifiers: Theory and Practice; James J Roberge; John Wiley & Sons; 1st Edition)
3. http://www.nptel.ac.in/courses/117106088/1 (Electronics for Analog Signal Processing II)
4. http://analogcorner.net/

Coordinators:

Prof. K. Radhakrishna Rao
Department of Electrical EngineeringProf (Retd),IIT Madras.Texas Instruments,India

7	Module 7: Waveform Generators	31. Waveform Generation 32. LC Oscillator – Effect of Non-idealities 33. Transconductor based Oscillator 34. Regenerative Comparators and Non-Sinusoidal Oscillators 35. Non-Sinusoidal Oscillators and VCO (FM & FSK Generators)
8	Module 8: PLL and FLL	36. Phase and Frequency Followers 37. Frequency Locked Loop (Popularly known as PLL) 38. Design of PLL and FLL
9	Module 9: Analog System Design	39. Analog System Design

References:

1. Design with Operational Amplifiers And Analog Integrated Circuits, 3rd Edition; Sergio Franco; Tata Mcgraw Hill Education Pvt. Ltd.; 2002
2. Analog integrated circuit applications; J. Michael Jacob; Prentice Hall, 2000