NPTEL ONLINE CERTIFICATION COURSES

Course Name: *Analog Electronic Circuits*

Faculty Name: *Dr. Pradip Mandal*

Department : *Electronics and Electrical Communication Engineering*

Topic:

Introduction to the course

CONCEPTS COVERED

Concepts Covered:

- Few words about the course
- What is Electronic Circuit
- A Typical Electronic System
- Fate of Analog Electronic Circuits in digital era
- Scope of Analog Electronic Circuits

About the course

- **It is primarily a core course for *undergraduate students*.**

- **It is a *refresher* course, particularly for *master level* students and for circuit designers working in industry**

- **Flow of the course:**
  - **It starts with basic circuit components and circuit concepts**
  - **Gradually moves to practical circuits which are building blocks of analog electronic systems.**

About the course (contd...)

- **Feature 1 of the course:**

  Maintaining a balance between theory and practice

  - **Discussed circuits can be constructed in UG laboratory**
  - **Measured performance of the constructed circuits can be easily compared with analytically predicted performance.**
  - **This approach helps to build confidence in circuit theory.**

About the course (contd…)

- **Feature 2 of the course:**
  Discussing BJT and MOSFET based circuits together

  - **Similarities and performance differences of the two classes of circuits are compared**
  - **BJT based circuits can be easily constricted on bread board to observe their characteristic**
  - **Whereas, analysis of the MOSFET based circuits provides necessary foundation for Analog VLSI circuit/system**

About the course (contd…)

- **Content of this course is well aligned to the content of Analog Electronics course (EC09) under**

  “AICTE Model Curriculum for undergraduate degree in Electronics and Communication Engineering (Engineering & Technology)”, published in 2018

Electronic Circuits

- **Circuit as Black box**
  - **Need to power up the circuit (*by DC source*)**
  - **Apply the "input *signal*" (or stimulus) and observe the "*output signal*"**

- **Nature of signals**
  - **Voltage, Current, Charge, Power ……**

Electronic Circuits (contd…)

- **Types of signals**
  - **Analog, Digital and Mixed signal**
  - **Continuous time and Discrete time**
  - **Meaningful levels**

- **Types of Circuits (based on signals)**
  - **Analog, Digital and Mixed signal circuits**

Electronic Systems

- **Electronic System containing**
  - **Analog, Digital and Mixed signal circuit modules**

- **Need of different types of circuit modules**

Electronic Systems (Contd…)

- **Need of different types of circuit modules**
  - **Analog circuits to interface with the real world**
  - **Digital circuits for flexibility and expansions**
    - **System programmability and functionality**
    - **Compact storage and Low power**
    - **Progress of supportive technology**

Fate of Analog Electronic Circuits

- **Evolution of Electronic Systems**
  - **More digitization with time**
  - **More applications**

- **Analog circuits will remain**
  - **However in evolved formats**

Emphasis of Analog Electronic Circuits

- **Analog building blocks**
  - **Working principles**
  - **Analysis and Design**
- **Integrating different building blocks**
  - **Cascading and Interfacing effects**
- **Practical Analog Modules**
  - **Working principles**
  - **Analysis and Design**

Conclusion

Conclusion:

- What is Electronic Circuit
- What is a typical Electronic System
- Analog Electronic Circuits remain in digital era
- Emphasis of “Analog Electronic Circuits”

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Thank you