



NATIONAL INSTITUTE OF TECHNOLOGY PATNA BIHAR – 800005

Deity, HRD Division, Ministry of ICT, Govt. of India Sponsored
Faculty Development Programme (FDP) on

ANALOG ELECTRONIC CIRCUITS

(Module: 02)

20th – 30th June, 2016

Organized by Electronics and ICT Academy & Department of Electronics and Communication Engineering

Goal of Electronics and ICT Academy:

The main goal of the academy is to train the faculty members of different technological and other Institutes in different areas of Electronics and Information & Communications Technology all over India. The resource persons will be from IITs/NITs and Industry. The courses would be conducted in the premises of NIT, Patna as well as at identified venues in Bihar, Jharkhand, Odisha and West Bengal for which all the resource persons and facilities will be provided by the Academy at NIT, Patna.

About the Course: Analog Electronic Circuits is one of the most fundamental and vital course for Electronic Engineers. This gives the very foundation for the Analog Design. Through this course candidate can have the basic introduction for VLSI. After attending the course candidate will get exposure of different State-of-art methods for the analysis and design of analog circuits.

Course Contents:

Op-amp circuits: Ideal and non-ideal op-amps; Op-amp realization of the four controlled sources (CCVS, VCVS, VCCS and CCCS); inverting/non-inverting integrators and differentiators; finite variable-gain amplifiers and instrumentation amplifiers; programmable gain amplifiers.

Nullator, norator, nullor and their applications: nullator, norator and nullor; nullor equivalents of an ideal BJT, ideal MOSFET, ideal op-amp and OTA; Controlled source representations using nullators and norators; NIC, PIC, NII and PII/gyrator and their nullor representation, analysis and simplification of circuits containing nullators and norators; application of nullors in deriving equivalent op-amp GIC/gyrator circuits; nullor implementation using commercially available ICs.

Non-ideal op-amps: input bias current and its compensation; effect of and limitations due to the finite slew-rate; finite GBP, gain-bandwidth coupling and the effect of finite GBP on the performance of op-amp circuits; passive and *active* compensation of op-amp circuits; typical *active-compensation* methods and their applications

Non-linear applications of op-amps: Log/Antilog amplifiers; Precision rectifiers; op-amp as comparator, zero-crossing detector; Schmitt trigger, astable and monostable multivibrators; square/triangular wave generators, triangular to sine converters

IC 555 timer and its applications: various operational modes; typical applications of IC Timers: power ON/OFF time delay; astable multivibrators (AM); AMs with 50% duty cycle; AMs free from *first cycle timing error*; monostable multivibrators; linear VCOs; tone burst generator; Miscellaneous other applications of timers

OTAs and their applications: bipolar OTA architectures: LM3080 and LM13600/13700; basic linear circuits using OTAs; electronically-variable resistance and inductance simulators; OTA-C simulation of other types of impedances; OTA-C filters and OTA-C Sinusoidal Oscillators; methods of derivation of OTA-C circuits from well-known op-amp-RC circuits

Nonlinear applications of OTAs: operating the OTA in saturation; Schmitt trigger, square/triangle wave generators; linear VCOs/CCOs using OTAs; analog multipliers using OTAs; other miscellaneous applications of OTAs.

Miscellaneous analog ICs: Analog multipliers: Gilbert multiplier cell; pre-distortion circuit, complete multiplier circuit; basic applications of analog multipliers; PLL and its applications; IC function generators; other analog ICs

Expert Speakers:

Prof. S. C. Dutta Roy, Formerly at IIT Delhi

Prof. P. V. Ananda Mohan, Advisor ECIL, Bangalore

Prof. T. S. Rathore, Former Professor, IIT Bombay

Prof. Raj Senani, NSIT, New Delhi

Prof. Shanthi Pawan, IIT Madras

Prof. Aniruddhan Sankaran, IIT Madras

Prof. Nagendra Krishnapura, IIT Madras

Prof. M. P. Tripathi, NIT Patna

Prof. Pragati Kumar, DTU, New Delhi

Dr. S. S. Gupta, Ministry of Commerce and Industry, Govt. of India.

Eligibility: The programme is open to all faculty, PG, Ph.D. students from Electronics Engineering, Electronics and Communication Engineering, Electrical and Electronics Engineering and other allied disciplines from Engineering Colleges all over India.

Registration Fee:

For PG & Ph.D. students : Rs. 1500 /-

For Faculty: Rs. 3000 /-

How to Apply:

Filled in application form (downloaded from the website www.nitp.ac.in) in the prescribed format duly signed and sponsored by appropriate authorities along with the demand draft has to be sent to the coordinator by post. It is also mandatory to send scanned application form and DD through mail to munish@nitp.ac.in. The DD must be drawn in favour of "Director, NIT Patna" payable at Patna. Registration fee can also be deposited through NEFT and the hard copy of bank transaction has to be attached with the application. The bank details are as follows:

Bank Name: Allahabad Bank, NIT Patna

A/c No: 20353663911

IFSC Code: ALLA0212286

A/c Holder Name: Registrar, NIT Patna

Selection Criterion: Selection will be done on first-cum-first-serve basis and the confirmed candidates will be notified immediately. The maximum numbers of participants will be 50 (fifty).

Last date of submission of application: 17.06.2016

FORMAT OF APPLICATION

Electronics and ICT Academy

Faculty Development Programme On
ANALOG ELECTRONIC CIRCUITS (MODULE: 01)
(20th - 30th June 2016)

1. NAME:
2. DESIGNATION:
3. INSTITUTION:
4. E-MAIL:
5. PHONE NO:
6. DD No.: Amount Rs.
BANK NAME:
DATE:
7. ADDRESS FOR CORRESPONDENCE:
8. EDUCATIONAL QUALIFICATIONS WITH SPECIALIZATION:
9. SUBJECTS TAUGHT SO FAR:
10. NO. OF REFRESHER COURSES / WORKSHOPS ATTENDED:
11. EXPERIENCE (IN YEARS)
TEACHING:
RESEARCH:
INDUSTRY:
12. ACCOMODATION REQUIRED: YES / NO

SPONSORSHIP CERTIFICATE

Dr/Mr./Ms. is an employee of our Institute / Organization and is hereby sponsored to participate in the FDP on Analog Electronic Circuits (Module 02) sponsored by ICT Academy at NIT Patna during 20th to 30th June 2016 at the National Institute of Technology (NIT), Patna.

Place:

Date:

Signature of the Head of the Institution

(with official seal)

ADDRESS FOR CORRESPONDENCE

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Patron

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Director, NIT Patna

Coordinator

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Dept. of. E.C.E, NIT Patna

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Prof. U. S. Triar

Prof. G. Pradhan

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Dr. Asit Narayan