



B-30, Institutional Area, Sector-62,
NOIDA – 201 307
ISO 9001:2008 COMPANY



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POST GRADUATE DIPLOMA IN EMBEDDED SYSTEM & VLSI DESIGN

Last date for Online Registration:

21st January 2012

Date of Entrance Exam:

28th & 29th January 2012

Date of Result Declaration:

2nd February 2012

Last Date of Payment of 1st installment of fees for selected candidates: **9th February 2012**

Last Date of payment of 1st installment of fees for waitlisted candidates: **10th February 2012**

Commencement of Course: **13th February 2012**

CDAC PROFILE

C-DAC, Noida was established with the mandate to undertake and promote State-of-the-Art Scientific Research & Development of electronics, and to design & develop Electronics Equipment and Systems for the growth of Electronics Industry. The main focus and objective of the organization lies in the development of High skill manpower in various platform of IT industry through HRD activities, transiting the goal of Ministry of Information Technology, Government of India, to bring fruits of Information Technology to every walk of life.

C-DAC, Noida conducts and concentrates on high-end training in Information Technology and other emerging related areas at Post Graduate Levels (Formal & Non-formal), which should provide the basis for sustainable growth and high value added employment to multi-talented I.T. personnel.

PGDEVD - Objectives And Focus Areas

The Post Graduate Diploma in Embedded system and VLSI Design is a six months (24 weeks) full time programme aimed at training engineers from the field of Electronics/Electrical/Computer science / Instrumentation. The programme has two main stream i.e. in areas of Embedded Technology and VLSI Design comprising of 8 main modules. Embedded System Design module will focus on Software Programming, Micro-controller Programming and Embedded Programming in Real Time System, where as VLSI Design Module focus on HDL Programming, FPGA and Synthesis with full custom ASIC Design using EDA tools. This programme will also extend emphasis on various domains e.g. Telecom, e-Security etc. by means of developing application as well as expert sessions from industry.

This unique combination of technologies broadens the scope for the budding engineers. The course is designed with equal emphasis on hardware and software catering to the demands of the industry.

FACILITIES AT CDAC NOIDA :

State-of-the Art Infrastructure, Well-equipped Library with access to International Journals, WiFi Network, Industry focused curriculum and Course Contents leading to International Certification, Creative cum learning work environment, Active placement cell, Experienced and resourceful faculty, Close and constant contact between faculty and students.

ELIGIBILITY CRITERION

- B.E / B.Tech., ME / M. Tech . or equivalent in Electronics/Electrical/Electrical & Electronics/Computer/Electronics and Telecommunication/ Instrumentation and M. Sc (Electronics)
- Students appearing for the final semester examination are also eligible.
- Candidates should have minimum 60% in last qualifying degree. Also Candidates should not have less than 60% in more than one of the academic qualifications. Candidate who have less than 50% in any of the qualifications are Not Eligible. Students who have appeared for final semester Examinations are also eligible for this course.

PLACEMENT CELL

Co-ordinates the task of organizing Campus Interview for the students just before the completion of the course in order to help them to secure attractive jobs. The candidates should keep in mind that selection will depend on the selection criteria and qualitative requirements of the company and the placement cell has no say on the recruitment policy and process of the company visiting the campus. Brief list of companies that visited CDAC, Noida are Wipro, HoneyWell, Satyam, Patni Computers NEC-HCL, Cadence, Mentor Graphics, Virage Logic, ST, Tech. Mahindra,UHG, MBT, IBM, Bharti TeleSoft, Samsung, Network Programs, Quark, NetSys Software, PI Softech etc. Candidates of this programme have got 100% placement opportunities in previous years.

EMBEDDED SYSTEMS DESIGN MODULES

VLSI DESIGN MODULES

FUNDAMENTALS OF SOFTWARE PROGRAMMING

Object Oriented Programming with C++

- Introduction to C++ programming language
- Concepts of OOPS
- Classes and objects
- Inheritance
- Static and dynamic polymorphism
- Files and streams

Linux Shell programming

- Command line
- VI Editor
- Pipes and redirection I/O.
- Filters, loops and controls
- Shell Key Word
- Test Commands
- Tee and Find

Operating System Concepts

- Process Management, Scheduling algorithms
- Concurrency of processes
- Memory Management – Paging & Segmentation
- File Management
- Features & Standard IO Process & Parameters

Data structures

- Introduction to data Structures
- Lists ,Stacks & queues
- Trees and graphs
- Searching & Sorting algorithms
- Link list

EMBEDDED PROGRAMMING USING MICROCONTROLLERS

8bit Micro-controller programming 32 Bit Micro-controller Programming Using ARM

- Introduction to Micro-controllers.
- AVR AT90S 8515 & ATmega 32 Processor Architecture.
- Instruction Set.
- Interfacing Hardware to the AVR
- LED Switches ADC, DAC, Serial Port Interfaces.
- Interrupts and Pipelining
- Timers
- Introduction to 32-bit micro controllers
- ARM Instruction Set
- The ARM GNU Tools and ARM Developer Suite
- Overview of ARM and Thumb Instruction Sets
- Architectural Support for High-level languages
- AMBA
- ARM MMU architecture
- ARM Development Environments

EMBEDDED PROGRAMMING IN REAL TIME

Linux systems programming

- The Linux Kernel in detail
- Unix File API
- Unix Process API
- Inter Process Communication
- Multithreading
- Network Programming in Linux using sockets.

Real Time OS

- RTOS Concepts
- Introduction to RTLinux/
- IPC in RTLinux / Programming API of RTLinux/ Debugging

D D Programming

- Kernel configuration (adding modules)
- Types of device drivers
- Building character drivers
- Debugging techniques
- Interrupt Handling

Project Work

HDL PROGRAMMING

VHDL

- Basic Language Elements
- Behavioral Modeling
- Data flow modeling
- Structural modeling
- Generics & configuration
- Subprogram and Overloading
- Packages and Libraries
- Finite state machine
- Verification, Writing Test Bench

FPGA & SYNTHESIS

- Logic Synthesis
- Introduction to logic & behavioral synthesis
- Technology mapping
- Adding design constraints
- Reporting to timing , area, fan-in & fan-out through logic synthesis

FULL CUSTOM ASIC DESIGN

- ASIC Design Flow
- Schematic and Layout Design
- DRC,LVS & Post Layout simulation of basic components of cell library.
- Study of Layout design issues like Electro-migration, Antenna effect, Hot electron effect, Latch up, Hot wire effect, drain punch through,
- Floor Planning , Placement Planning, and routing

ADVANCED DIGITAL DESIGN

- Basic overview of digital components
- Flip flop operations
- Setup and HoldTime Concepts
- Design of Mealy and Moore circuits
- State machine concepts
- State reduction algorithm

VERILOG

- Intro. to HDL & language Elements
- Modeling Styles in Verilog
- Compiler Directive, Data Types & Operators
- Gate Level, Data Flow & Behavioral Modeling and structure Modeling
- Task & Functions
- Verification, Writing Test Bench
- Switch Level Modeling and UDP
- Basics of System Verilog
- System Task and Functions
- State machine modeling

FPGA BASED DESIGN

- Introduction to PLDs & FPGA architecture
- FPGA Design Flow
- Logic Synthesis & Implementation
- Advanced Design Performance
- Design optimization
- Back annotating timing & parasitics

SPICE SIMULATION

- Design Flow
- Introduction to SPICE
- Circuit descriptions
- DC Circuit analysis
- Transient analysis
- AC circuit analysis
- Semiconductor Devices
- Schematic Capture, Spectre simulation

CMOS VLSI DESIGN CONCEPTS

- Introduction to CMOS and its Characteristics
- MOS structure and fabrication steps.
- CMOS Logic design
- Transmission Gates
- Device sizing and analysis

SUBMISSION OF APPLICATION & ENTRANCE EXAMINATION

For submission of Application Form, visit website www.cdacnoida.in. Registration for the course would be done **ONLINE**. All Candidates **must** also send the print out of the application form along with the self-attested photocopies of mark sheets and DD (if mode of payment is DD) so as to reach the below mentioned address. Candidates who have paid vide **Credit Card** are also required to send the print out of the application form along with the self-attested photocopies of marksheets. The last date of form submission is on or before **25th January 2012**. It is advised to read the General Instructions carefully before filling up the Application Form. Registration Fee is **Rs. 300/-** per course. Fee can be paid through DD or Credit Card only. DD should be in favor of CDAC, Noida payable at NOIDA. A candidate can apply for one or more than one course. Payment for each course has to be done separately. If payment is made through Credit Card then candidate shall be redirected to Payment Gateway of ICICI Bank by S/W wherein candidate can fill necessary details to complete the registration. There will be an **Online Entrance Examination** in 4 slots on **28th & 29th February 2012** at C-DAC, B-30, Institutional Area, Sector – 62, NOIDA. **The test would be conducted in 2 hrs slots and would be of Adaptive Type consisting of Multiple Choice Questions based on the following:** Basics of *Digital Electronics, Circuit theory, Microprocessor, Linear IC application, Concepts of Operating Systems, Introduction to computer s, C Language, , OOPS Concepts, General English, Analytical reasoning, Quantitative Aptitude.* For further details please visit www.cdacnoida.in/SOE

REGISTRATION FEES

Fee for the Course is Rs. 55,150/- inclusive of Service Tax @10.3%, payable in two installments (First installment Rs. 33,090/- and Second of Rs. 22,060/- both inclusive of service tax) by Demand Draft in favour of CDAC, NOIDA payable at Noida. First installment of fee is to be deposited by the selected candidates at the time of admission i.e. on or before **9th February 2012**. The second installment is to be paid on the first working day of the programme i.e. **13th February 2012**. Course Fee is Non-transferable & Non-refundable. Fee may be refunded with certain conditions only, which will be declared along-with result of the programme. In case, any selected candidate does not pay first installment of fee by **9th February 2012**, his/her seat will be treated as vacant. Such vacant seats will be allotted to candidates in waiting list. Wait listed candidates may contact CDAC, NOIDA at 10:00 am at the venue given below on **10th February 2012** for allotment of seats on merit basis.