

Department of Computational and Data Sciences (CDS)
Indian Institute of Science, Bangalore
Computer Systems (CDS-CS)
PhD and M.Tech (Research) Admissions 2016

This brochure provides information on the Research Admission process into the Computer Systems Stream (CDS-CS) of CDS for 2016. It describes the research laboratories in the CDS-CS stream which are accepting students this year, and the topics for the written and oral components of the research interview. A ***Preference Sheet*** appended at the end of this brochure must be filled and signed by you when you appear for the interview.

A. Research Activities at CDS

Research activities at CDS are categorized into two streams: *Computational Science* and *Computer systems*. Research admissions are conducted separately for each stream, so please refer the appropriate brochure.

B. Research Interview– Computer Systems Stream (CDS-CS)

The interview process for the Computer Systems stream has two stages: **Written** and **Oral** (both conducted on the same day).

1. **Written component** (*Duration: 30 minutes*): A written exam consisting of short answer questions is conducted first to test the candidate's suitability for the research programs at CDS. The questions will be from the following subjects: Programming in C, Data Structures, Algorithms, Discrete Mathematics, Probability and Statistics. The level of preparation expected will be at the final year engineering undergraduate level.
2. **Oral Interview**: Candidates who are successful in the written component will attend an oral interview before a CDS-CS faculty committee. In the oral interview, you will be questioned on:
 - **Basic Area Subjects**: Programming in C, Data Structures, and Algorithms. Students are expected to be prepared in all these subjects for oral examination. The level of preparation expected will be at the final year engineering undergraduate level.
 - **Advanced Topics**: Topics related to labs selected in preference sheet from the following: *Computer Architecture, Operating Systems, Algorithms, Distributed Systems, Machine Learning, Natural Language Processing, Signal Processing, Image Processing, Linear Algebra, Probability.*

C. List of labs that accept students

1. Computer Architecture Lab

Faculty: **Mathew Jacob** (<http://www.serc.iisc.ernet.in/people/faculty/matthew.htm>)

Areas: Computer Architecture

2. Distributed Research on Emerging Applications & Machines (DREAM) Lab

Faculty: **Yogesh Simmhan** (www.serc.iisc.ernet.in/~simmhan)

Website: www.dream-lab.in

Areas: Distributed systems, Cloud Computing, Big data abstractions and platforms, graph and stream analytics.

3. Machine And Language Learning (MALL) Lab

Faculty: **Partha Pratim Talukdar** (<http://www.talukdar.net>)

Website: www.talukdar.net/mall-lab

Areas: Machine Learning, Natural Language Processing, Machine Reading

4. Middleware And Runtime Systems (MARS) Lab

Faculty: **Sathish Vadhiyar** (www.serc.iisc.ernet.in/~vss)

Website: mars.serc.iisc.ernet.in

Areas: Mapping parallel applications to machines, GPU computing, Middleware for parallel systems, Fault tolerance for parallel applications

5. Video Analytics Lab

Faculty: **R. Venkatesh Babu** (www.serc.iisc.ernet.in/~venky)

Website: val.serc.iisc.ernet.in

Areas: Deep Learning for Computer Vision, Object Detection, Tracking, Segmentation, Image/Video Representation and Retrieval, Action Recognition, Crowd and Traffic Analysis.

6. Computer Aided Design Laboratory

Faculty: **S. K. Nandy** (<http://cadl.iisc.ernet.in/cadlab/people/nandy/>)

Website: <http://cadl.iisc.ernet.in/cadlab/>

Areas: System-on-Chip (SoC) design for applications spanning media streaming and network processing

7. Cloud Systems Lab

Faculty: **J. Lakshmi** (<http://www.serc.iisc.ernet.in/~jlakshmi>)

Website: http://www.serc.iisc.ernet.in/~jlakshmi/Research/CloudsandQoS/Cloud_Architectures_and_QoS.html

Areas: Cloud system Architectures for end-to-end QoS of hosted applications

Preference Sheet for Ph.D./M.Tech(Res) Research Admissions – Computer Systems Stream (CDS-CS)

Carefully review the brochure and Research Lab descriptions before filling in this Preference Sheet. Choose the lab(s) whose research areas most closely match your own interests. You may choose up to three labs. Ph.D. students, if admitted, will be placed in the lab(s) chosen here, and this selection is binding.

1. Name: _____

2. Application No: _____

3. Program: (*Tick one*) M.Tech. (Research) Direct Ph.D. Ph.D.

4. External Research Program Candidate? (*Tick one*) No Yes

Select one to three of the Research Labs below.

Computer Architecture Lab

Distributed Research on Emerging Applications & Machines (DREAM) Lab

Machine And Language Learning (MALL) Lab

Middleware & Runtime Systems (MARS) Lab

Video Analytics Lab

Computer Aided Design Laboratory

Cloud Systems Lab

I have read and understood the brochure and the instructions before filling in this Preference Sheet.

Signature: _____

Date: _____

Place: _____