

**Department of Engineering Design**  
**Indian Institute of Technology Madras**  
**Guidelines for conducting the Ph.D. Comprehensive Examination**  
**In effect from April 2013**

The Comprehensive Examination (CE) will consist of the following three components:

- a) Core written exam (3 hours, Weightage: 20 marks, 9 am to 12 pm on the day of the exam)
- b) Elective written exam (3 hours, Weightage: 40 marks, 2 pm to 5 pm on the day of the exam)
- c) Viva voce (Weightage: 40 marks)

The written exams (a and b) will be held on a single day and the viva voce will be conducted on a different day.

Core written examination: The candidate is expected to choose one of the following topics for the core written examination:

Mechanical Science:

1. Mechanics of Rigid Bodies
2. Mechanics of Deformable Bodies
3. Machine Design
4. Manufacturing Science

Electrical Science:

5. Analog Circuits
6. Digital Circuits
7. Microprocessor and Microcontroller
8. Signals and Systems

Computer Science:

9. Data Structures and Algorithms

Elective written examination: The candidate will choose the elective topic based on the area of the proposed research / or any other relevant topic based on the discussion with the guide.

The comprehensive exams will be conducted in February and August of each year. The HOD will announce the date of the written exam every semester and all the candidates are expected to take the written exams on this date.

No formula or text book will be allowed during the examination.

**Conduct of viva voce:** The candidate will be given a research paper (by his/her guide(s)) at least 2 weeks before the viva voce to prepare a critique of the same. This critique constitutes the viva voce presentation. This presentation should not exceed 10 slides with only one slide allotted for the proposed area of research. The candidate is expected to make this presentation within 10 minutes.

A written report (A4 size) should also be submitted a week before the conduct of the viva-voce. The report should contain: i) academic data sheet, ii) a brief report on a research work (about one page), iii) a brief report/critique on the research paper (about one page).

**Pass Criteria:** A research scholar is considered to pass the comprehensive examination if

1. *He/she secures a minimum of 60 marks (out of 100 marks) in the sum of the marks of the written exams and the viva voce, AND*
2. *He/she secures a minimum of 50 % in each of three components (i.e., at least 10 out of 20 in the core exam, 20 out of 40 in the elective exam and 20 out of 40 in the viva voce).*

**Responsibilities of the Research Scholar:**

1. Contact the guide(s) in November/May to discuss the written exams.
2. Inform the ED office regarding the choice of the core and elective paper.
3. Contact the guide(s) periodically to receive the elective exam syllabus by December/June.
4. Obtain the research paper for critiquing at least 2 weeks before the date of viva voce.
5. Submit the report (A4 size) to the DC member (in person) and the examiners (through the ED office), a week before.
6. Prepare the viva voce presentation confirming with the instructions given.