

**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
DEPARTMENT OF CIVIL ENGINEERING**

Sub: Selection Process for the Admission to Ph.D. Programme, Civil Engineering Department, IIT Bombay for 2024-25 (Autumn Semester)

Dear Candidate,

This letter is to be read in conjunction with the call letter that you will be receiving from the Academic Office, IIT Bombay.

You need to attend the interview in-person (offline) only, which will be organized by various specializations (i.e. CE1 to CE7) of the Civil Engineering Department, IIT Bombay during **13th and 14th May 2024**, at Civil Engg. Department, IIT Bombay. Candidates must report in-person **on Monday 13th May 2024 at 09:00 hrs. at Civil Engg. Department office, IIT Bombay**.

Note that for **CE4: Structural Engineering**, there will be an in-person (offline mode) written test first on **13th May 2024** and an interview of the only shortlisted candidates from the written test. For all other specializations, i.e. CE1, CE2, CE3, CE5, CE6 and CE7, there will be only interviews, in-person (offline mode). One candidate can appear for only ONE specialization in order of their preference given in application.

The exact schedule for the PhD interviews on 13th and 14th May 2024 will be displayed on the websites of the [Department of Civil Engineering, IIT Bombay](#).

Please ensure to visit www.civil.iitb.ac.in frequently for all updates regarding the details of the interview. In case of urgency, please contact Mr. Paras / Mr. Sandeep / Mr. Sanjay; Phone: +91-22-25767301/ 25767303/ 25763690; Mobile: +91-8898249343 (Mr. Paras); Mobile: +91-7415977668 (Mr. Sandeep); Mobile: +91-9820157595 (Mr. Sanjay); email: pgadm@civil.iitb.ac.in

The selection will be based on the performance in the interview. During the interview, in addition to the technical knowledge on the subject, research aptitude, and communication skills may also be tested. The decision of the committee is final and cannot be changed under any circumstances.

The candidates are advised to refer to the research areas and activities of the Civil Engg. Department faculty members at <https://www.civil.iitb.ac.in/faculty> before appearing for the interview. Candidates are also encouraged to contact prospective research supervisors (through email) well before the interview to understand their requirements and expectations.

Candidates shall prepare a research proposal for the opted specialization (at the most one) with research topics and may present the same at the time of the interview. Each research proposal should be written in about 500-1000 words highlighting the research need, proposed methodology, design of model/experiment, expected contributions, and a few key references.

Wish you all the best.

**Prof. Deepankar Choudhury,
Prof. T. Kant Chair Professor (HAG) & Head,
Department of Civil Engineering,
IIT Bombay, Powai, Mumbai 400076, India.**

Date: 24th March 2024

Written test for Structural Engineering (CE4)

The written test shall be of **90 minutes** duration and the syllabus for the written test is given below. The written test will be used only for shortlisting the candidates for the interview. The **cut-off marks** for the written test to qualify is set to (**mean + 0.5 standard deviation**) for General/Open category (GEN) candidates. For OBC-NCL, on successful submission of proper certificate, the cut-off marks will be 0.9 times cut-off marks for GEN candidates. For SC/ST/PwD candidates, on successful submission of proper certificate, the cut-off marks will be 0.67 times cut-off marks for GEN candidates. The final selection of the shortlisted candidates is based on interview marks only.

Candidates are required to bring their own calculator and stationery. Borrowing of material and use of Mobile are NOT allowed during the Examination.

Syllabus for the Written Test in CE4

Engineering Mechanics: System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Friction and its applications; Energy methods; Principles of virtual work.

Solid Mechanics: Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Theories of failures; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, buckling of column, combined and direct bending stresses.

Structural Analysis: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

Concrete Structures: Working stress, Limit state and Ultimate load design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete; Analysis of beam sections at transfer and service loads.

Steel Structures: Working stress and Limit state design concepts; Design of tension and compression members, beams and beam-columns, column bases; Connections- simple and eccentric, beam-column connections, plate girders and trusses; Plastic analysis of beams and frames.

Basic Engineering Mathematics: Linear Algebra; Single Variable Calculus; Ordinary Differential Equations; Probability and Statistics; Numerical Methods.