

Course structure for ICTS Ph. D student (2015)

Students have to do five core courses which will include one advanced course in experimental physics. The core courses are compulsory but the students will be allowed the option of a drop-test for all the courses except the experimental physics course. Students will do five more specialized courses which can be either reading courses or topical courses. A list of some of the available topical courses offered in IISc are given below. In addition to these, the student can opt for topical courses offered in TIFR-CAM and NCBS. In addition, students will do two research projects with ICTS faculty members.

The students will have to complete course-work by the end of 3 semesters and at most 4 semesters. There will be some flexibility but the standard break-up would be as follows.

(The number mentioned in each line is the number of credits)

Semester 1 (Aug-Nov): Total credits --- 24

Advanced statistical physics (IISc, core) - 4

Classical mechanics (ICTS, core) - 4

~~Advanced Experiments in Condensed Matter Physics (IISc, core) - 12~~ **Elective course - 4**

Topical/elective course – 4

Semester 2 (Jan-Apr): Total credits --- 16

Quantum mechanics-II (IISc, core) - 4

Numerical methods (ICTS, core) - 4

~~Topical/reading course — 4~~ **General Physics Lab (ICTS, core) - 12**

Topical/reading course - 4

Summer (May-Jul)---6

Research project – 6

Semester 3 (Aug - Nov) Total credits --- 14

Research Project - 6

Topical/reading course - 4

Topical/reading course – 4

Total credits = 24+16+6+14 = 60

Course break-up: Core courses (28), Topical/reading courses (20), Projects (12)

Some notes on core courses, reading courses and projects

- 1) Core courses are compulsory. If a student feels that he/she already knows the course well enough, they have the option of taking a drop test in the beginning of the course. A satisfactory performance ($> B$) then allows the student to automatically earn credits for the course.
- 2) Reading courses can be taken by students with any faculty member at ICTS. It is required that the course be graded through regular assignments or through two exams (mid-term and final) or a combination of these. Based on these a final mark and grade will be given.
- 3) Projects can be done with any faculty member at ICTS. The student will be graded based on
 - (i) a project report to be examined by the project guide
 - (ii) a seminar presentation to be examined by a two member committee. The weightage on these will be equal and, based on these, a final mark and grade will be given.

Comprehensive Examination

Ph.D students have to register for Ph.D before two years after joining ICTS. Before registering, students have to choose their prospective advisor. They are also required to give a comprehensive examination, whose structure is as follows:

1. The student will first give an oral presentation on his/her research/project work.
2. Then, the student will be orally assessed on a pre-set syllabus which includes three core courses, namely, classical mechanics, quantum mechanics and statistical physics, and one special course, which will be selected in consultation with the advisor.
3. Duration of the comprehensive exam will be about 2-3 hrs.
4. The assessment panel will comprise of the student's advisor, an external faculty and another ICTS faculty member. The panel will be chaired by the ICTS faculty member (non-advisor).

The students will receive a degree through the Physics /Subject Board of the Graduate School of TIFR.